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# FINAL

## Volume 3

# Environmental Statement
# Crude Oil Transportation Systems

Proposed by: NORTHERN TIER PIPELINE COMPANY
NORTHWEST ENERGY COMPANY
KITIMAT PIPE LINE LTD.
TRANS MOUNTAIN OIL PIPE LINE CORPORATION

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The Crude Oil Transportation Systems Final Environmental Statement is divided into four volumes plus a separate Summary:

Volume 1 contains a description of each of the four Title V proposals and a description and analysis of the proposed Northern Tier Pipeline Company system.

Volume 2 contains a description and analysis of systems proposed by Northwest Energy Company, Kitimat Pipe Line Ltd., and Trans Mountain Oil Pipe Line Corporation. A summary of the four Title V proposals is presented.

**Volume 3 contains alternatives to each of the four systems and public comment on the draft Environmental Statement. Environmental statement team responses are included. Glossary and References.**

Volume 4 contains maps relating to each of the four proposals.

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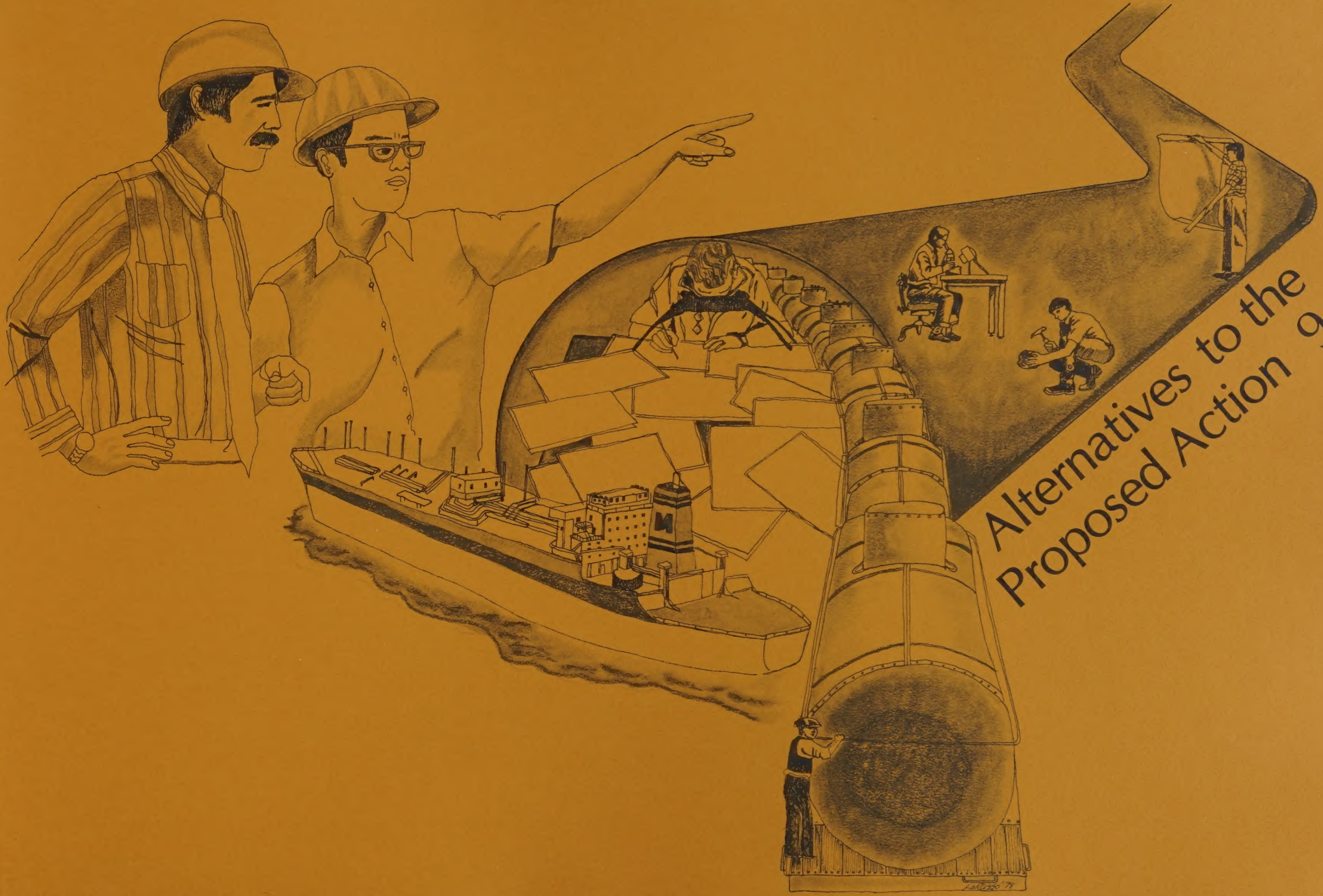
Volume 3 contains:

For all Title V applicants:
- Chapter 9 — Alternatives to the Title V Proposals
- Chapter 10 — Consultation and Coordination
- Glossary
- Reference

# Alternatives to the Proposed Action

# 9



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# ALTERNATIVES TO TITLE V PROPOSALS

## 9.1 Introduction

The previous chapters considered the environmental effects of constructing and operating crude oil transportation systems. This chapter considers the environmental effects of not selecting a proposed system, of delaying selection of a system, and of accomplishing the purposes of the proposed action by other alternatives.

While the specific environmental impacts of constructing, operating, or abandoning a crude oil transportation system depend upon the environmental setting, many are constant and common to each system. For example, while similar noise levels would be created in trenching for a pipeline in similar soils, the impacts of those noise levels would vary depending upon the location of the trench. While vegetation would be destroyed in the construction of onshore storage facilities, the type of vegetation may vary. While wildlife would generally avoid construction sites, the specific species may vary.

Rather than repeat those common elements, this chapter sets forth those impacts unique to the specific alternative or highlights those impacts considered to be the most important. See chapters 3, 5, and 8 for a detailed analysis of the environmental impacts common to each proposal.

## 9.2 No Action

The no action alternative assumes that the decision would be made not to select any of the four proposed crude oil transportation systems, thereby precluding implementation of the projects as proposed by the four applicants under Title V of the Public Utility Regulatory Policies Act of 1978.

No action on the proposals would avoid both adverse and beneficial impacts. Adverse environmental impacts as discussed in chapters 3, 5 and 8 would not occur. For example, adverse impacts of construction of access roads, temporary degradation of stream crossings, and disruption of farming operations would not occur. Increased oil-spill risks from tanker casualties in the Strait of Juan de Fuca, Douglas Channel, and Lynn Canal would be avoided. Oil pipeline spills would be eliminated, the risks of fire and explosion would be eliminated.

Beneficial impacts to regions located along the proposed pipeline corridors also would not occur. Employment and tax benefits generated by the construction and operation of the proposed pipeline projects would not materialize.

If one of the pipelines is not constructed and a crude oil shortage develops in the northern tier states, northern tier refineries would need to find alternative ways of obtaining crude oil, cut back, or stop production. A cut-back would lead to an increase in unemployment and loss of revenue. Alternative methods of transporting crude oil to northern tier refineries such as continuing tanker transport through the Panama Canal, may have higher transportation costs leading to higher product costs.

Without one of the proposals, the excess to west coast refinery needs would continue unless production at Prudhoe Bay were curtailed to equal west coast demand. This could result in adverse economic impacts in Alaska. If Prudhoe Bay production continues at full capacity, there may be increased environmental impacts and attendant oil spill risks in transporting Alaskan crude from Valdez through the Gulf of Mexico to the southern and eastern states.

## 9.3 Delayed Action

The delayed action alternative assumes that the selection is neither approved nor denied and that no new port facilities or crude oil pipeline as proposed by the applicants would be constructed pending permit approval or disapproval.

Many of the same impacts would result from the delayed action as from the no action alternative. Therefore the effects of a delayed action could be similar to that of no action for the length of the delay. The delayed decision of permit approval or denial for the proposals may result in no other alternative system being initiated pending the decision. Conversely, the delayed decision could accelerate the consideration of other alternatives, which, if implemented, could eliminate the need for the proposals.

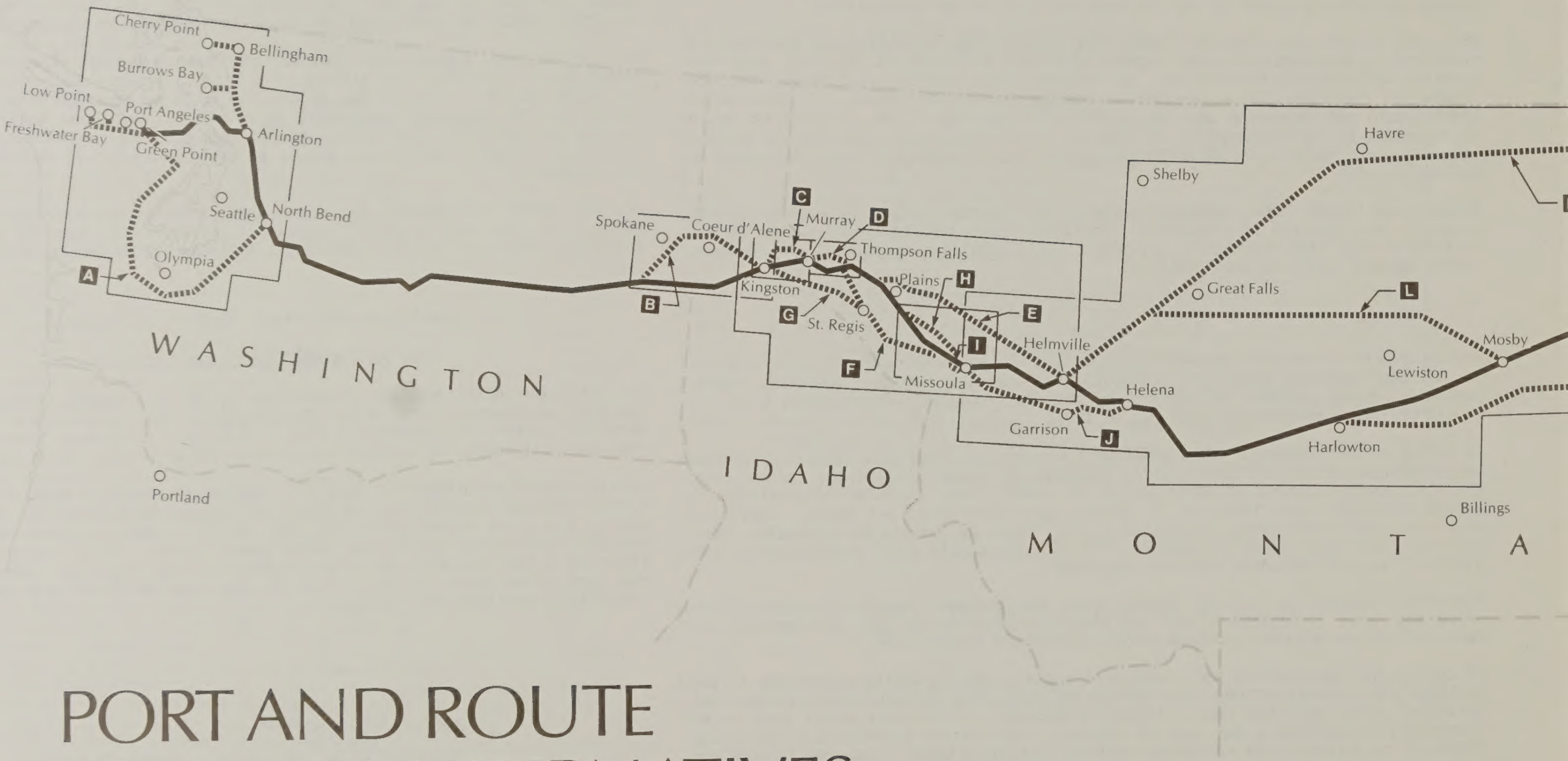
Delaying action on selecting any of the applicants' proposals would allow the Department of the Interior to gather additional environmental data for further analysis. This would permit a more thorough impact analysis of the four proposals.

## 9.4 Alternatives of Northern Tier Pipeline Proposal

### PORT AND ONSHORE FACILITIES ALTERNATIVES

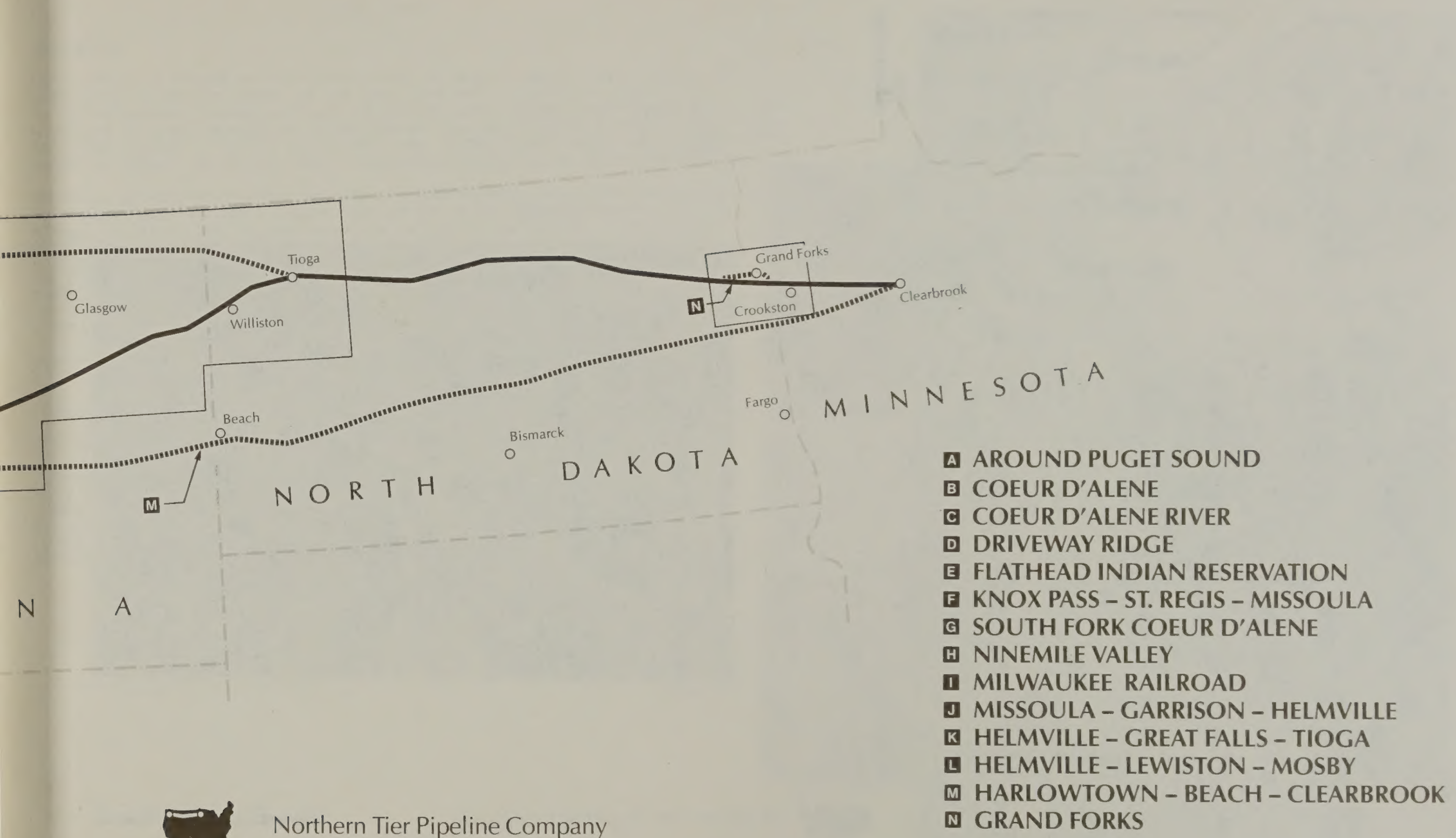
The following ports represent alternatives to the Port Angeles port proposed by NTPC. The five alternative ports being considered represent alternatives for a transshipment port which, in conjunction with a west coast to midwest pipeline, could serve the crude oil demand in northern tier states (figures 9.4-1 and 9.4-2).

Cherry Point and Burrows Bay were evaluated on the basis of similar tanker berthing, onshore storage facilities, and crude oil volume as proposed for the Port Angeles port. The ports of Freshwater Bay and Low Point were evaluated using single point mooring (SPM) sites rather than fixed tanker berth. Also, a hypothetical pipeline route to a junction with the proposed NTPC pipeline route was assumed. For each of the port alternatives a description is presented followed by a summarized impact analysis by environmental elements.



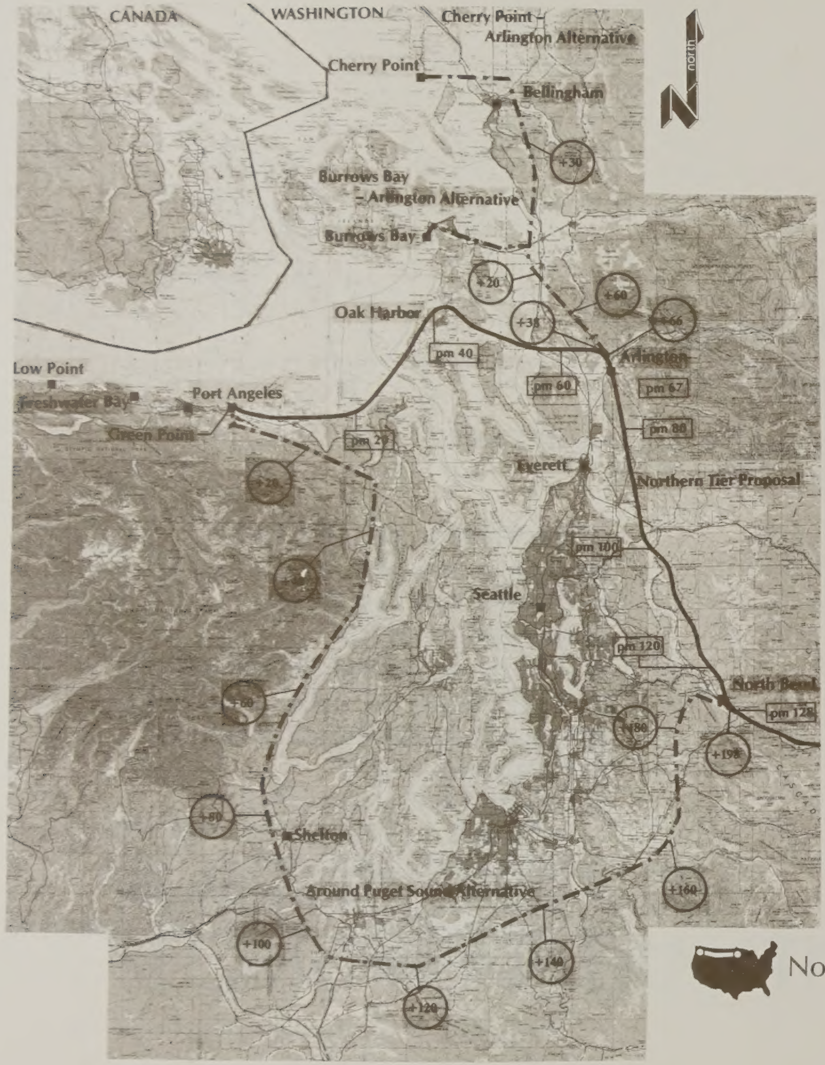
# PORT AND ROUTE SEGMENT ALTERNATIVES

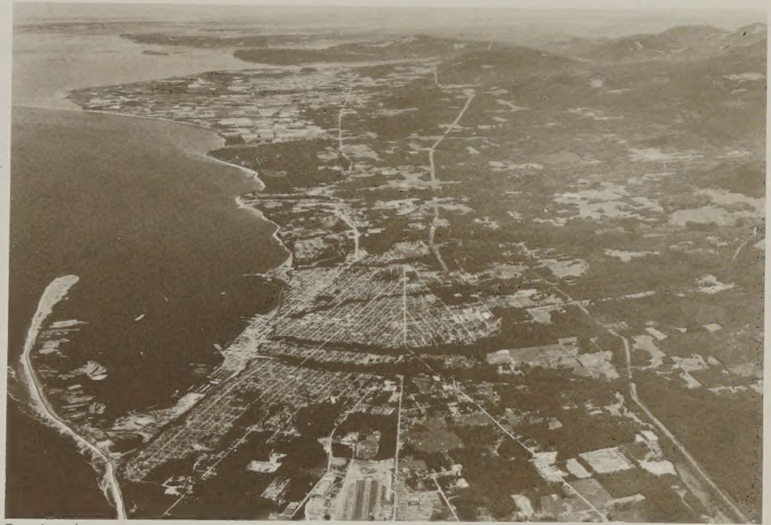
Figure 9.4-1


Tioga
Glasgow
Williston
Grand Forks
N
Crookston
Clearbrook
Beach
M
Bismarck
Fargo
MINNESOTA
NORTH DAKOTA
N A
A AROUND PUGET SOUND
B COEUR D'ALENE
C COEUR D'ALENE RIVER
D DRIVEWAY RIDGE
E FLATHEAD INDIAN RESERVATION
F KNOX PASS – ST. REGIS – MISSOULA
G SOUTH FORK COEUR D'ALENE
H NINEMILE VALLEY
I MILWAUKEE RAILROAD
J MISSOULA – GARRISON – HELMVILLE
K HELMVILLE – GREAT FALLS – TIOGA
L HELMVILLE – LEWISTON – MOSBY
M HARLOWTOWN – BEACH – CLEARBROOK
N GRAND FORKS

Northern Tier Pipeline Company

Outlined Areas Shown in Greater Detail Throughout Chapter 9





Port Angeles

Northwest Air Photos, Port Orchard, Washington 1974

Northern Tier Pipeline Company

Figure 9.4-2

# Ports and Around Puget Sound Alternative

# CHERRY POINT

## Description

Cherry Point is located at the southern end of Georgia Strait, approximately 10 miles from the Canadian border and 140 miles from the Pacific Ocean (figure 9.4-3). Two oil refineries, Atlantic Richfield Oil Company (ARCO) and Mobil Oil Company, have a combined refining capacity of 175,000 barrels per day. The firms have berthing facilities located in 65-foot and 42-foot water depths. Cherry Point is currently served by tankers off-loading into a shoreside pipeline to the storage facility.

Use of the existing Cherry Point facility as a transshipment port to off-load foreign and Alaskan crude oil would require construction of two additional berths, onshore storage facilities, and a pipeline to near Arlington, Washington. A new 42-inch, 66-mile-long, pipeline would be needed from the storage facilities to Arlington. From Cherry Point it would go eastward to an area north of Bellingham, then parallel the Trans Mountain Pipeline right-of-way to an area near Burlington where the Trans Mountain Pipeline turns westward to the Anacortes refineries. New pipeline construction and new right-of-way would be required for 66 miles south to Arlington, where it would join the proposed pipeline route.

Construction of this alternative port is prohibited by amendment to the Marine Mammal Protection Act (P.L. 95-136).

## Climate and Air Quality

No impacts on climate are anticipated.

Dispersion conditions for air pollutants in the Cherry Point area are generally good. Winds are primarily from southerly to southeasterly directions; northerly winds are common in winter. The average wind speed is about 7 miles per hour. Neutral and unstable atmospheric stability occurs about 53 and 18 percent of the time, respectively. Therefore, good atmospheric mixing takes place most of the time. Stable conditions, indicating less favorable dispersion, occur about 29 percent of the time.

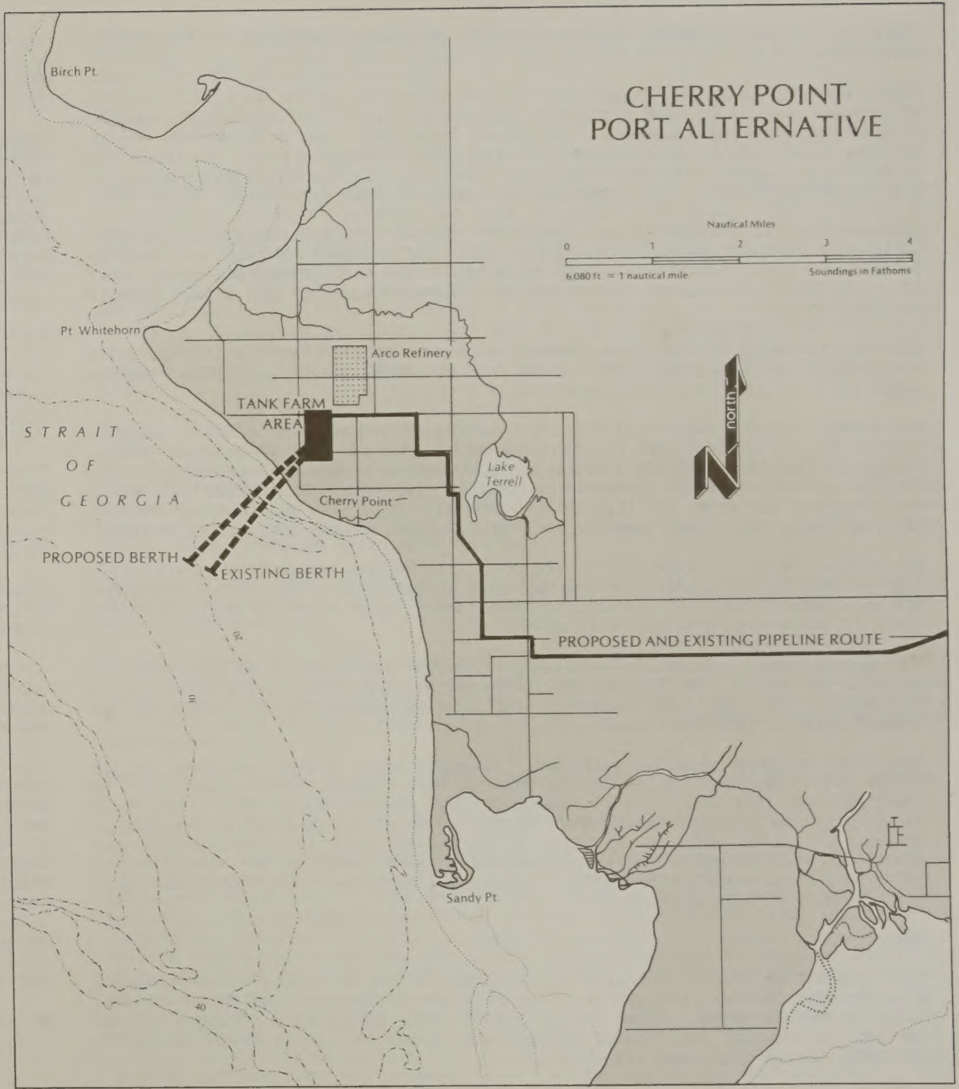


Figure 9.4-3

There is little available data on vertical temperature profiles or temperature inversions.

Major existing sources of air pollution consist of two refineries, an aluminum plant, and a paper mill which emit significant amounts of sulfur dioxide, nitrogen oxides, particulates, and hydrocarbons. Monitoring data exist for particulates, sulfur dioxide, ozone, and carbon monoxide. Air quality is generallly good. No violations of ambient air quality standards have been observed, with the exception of occasionally exceeding the state 1-hour standard for sulfur dioxide (SAI 1978).

Modeling for the proposed project pollution sources (SAI 1978) indicate that NTPC would need to limit the sulfur content of fuel used by tankers in port to about 1.0 percent in order to meet the 24-hour class II incremental standard for sulfur dioxide. The 3-hour average and annual average increments would be well within class II standards.

Modeling for existing emissions combined with project emissions resulted in 1,968 ug/m3, 1,389 ug/m3, and 635 ug/m3 for the maximum 1-hour, 3-hour, and 24-hour average sulfur dioxide concentrations, respectively.

The highest annual average sulfur dioxide concentration was 344.0 ug/m3 for existing sources only, and 345.0 ug/m3 for the combined existing and proposed sources. Tanker emissions therefore result in a negligible contribution to the concentrations. Since on-site monitoring showed lower concentrations than those calculated, the models overestimated pollution levels. It is unlikely, therefore, that the use of this alternate port site would cause any violation of the ambient air quality standard.

The maximum 24-hour average particulate concentration from the project is 4.4 ug/m3. This is well within the 24-hour average class II increment of 37 ug/m3. The annual average concentration is estimated as less than 1 ug/m3 which is well within the class II incremental standard of 19 ug/m3.

The highest annual average concentration of nitrogen oxides from this alternate port alone is 1.0 ug/m3. The highest annual concentration from existing sources only is 8.0 ug/m3. Thus the contribution of the proposed sources to the annual average concentration is relatively small.

There was no ozone modeling performed. However, since project emissions at the Cherry Point site would be similar to those at Port Angeles, ozone impacts would be about the same (SAI 1978). Little change in ozone concentrations would occur in the vicinity of the berthing facilities. Ozone concentrations downwind of the onshore storage facilities might be increased by 10 percent above background levels when conditions were favorable for ozone formation. Ozone levels in the area presently meet the federal standard (SAI 1978). It is not likely that the project would cause any violation of federal standards.

## Noise

Noise impacts would occur during the construction of the berthing facilities causing a noticeable increase in daytime noise at a few residences near the shoreline. Noise levels would be highest during pile driving operations. Onshore storage facility construction would cause daytime noise levels between 65 and 69 dBA at the residence nearest the construction site.

During the operation phase the primary noise source would be electric motors at the pump station. Noise levels would be about 58 dBA at 400 feet. Nearby residences might notice an increase of about 2 dBA above background noise levels.

## Topography and Geology

This port and 66-mile route segment alternative is characterized by relatively gentle terrain with a short stretch of modertely steep foothills at Lookout Mountain (Cherry Point route pipeline mile 20). Although the proposed route from Port Angeles to Arlington would require a 20+ mile submarine crossing, resulting in somewhat more acreage disturbed than on dry land, the overall terrain at both port sites and along their pipeline routes would be similar. Topographic impacts, consisting of minor landform changes and drainage alterations, would be essentially the same.

Geologic material encountered at Cherry Point and along the pipeline route to Arlington would be similar to that encountered at Port Angeles and along the proposed pipeline route to Arlington. It consists of Quaternary glacial and alluvial material with some outcrops of Tertiary sedimentary rock. Impacts would be similar consisting primarily of excavation of geologic material and excavation-induced changes in the physical characteristics of the material.

However, as the proposed route would involve a marine crossing and four steep coastal bluffs, substantially more geologic material would be excavated. Resultant impacts would be greater than along the Cherry Point-Arlington alternate.

### Geologic Hazards

Geologic hazards that could be encountered between Cherry Point and Arlington would be much the same as those encountered between Port Angeles and Arlington and would consist of seismicity and slope instability.

Cherry Point and the pipeline route to Arlington, like Port Angeles and the proposed pipeline route, is located in an area of moderate to high seismic activity, corresponding to a seismic risk zone 3 (maximum earthquake damage expected). Howver, no known active or potentially active faults or large magnitude earthquakes have been identified within 25 miles of the port site or pipeline route. While Port Angeles and the proposed pipeline have not experienced large magnitude earthquakes, the presence of an inferred, potentially active fault within 2 miles of the site and the level of seismic activity would indicate potential impacts from an earthquake would be greater than for the Cherry Point alternate.

Potential slope instability problems have been identified along the coastal bluffs at Cherry Point and along the west face of Lookout Mountain. While a slope failure at either site could result in substantial damage, considerably more damage could occur along the proposed route where the pipeline would cross four steep coastal bluffs.

### Mineral Resources

No significant difference in impacts.

## Soils

About 140 acres of soil would be permanently disturbed. Soil productivity would be lost by construction of facilities, dikes, and roads. The gradient of the land, along with retaining dikes would eliminate most erosion.

Fugitive dust losses at the storage facility site during construction would be in the range of 1.2 tons per acre per month and could be greatly reduced by regular watering.

Extending eastward from the storage site, the proposed route crosses a large glacial terrace plain with soils developed from glacial and post glacial outwash and recent alluvium. These soils are mostly of the Whatcom, Lynden, Norma, and Cagey series and occur on rolling topography. Textures are mostly silt loam, clay loam, and sandy loam. Permeabilities range from moderate to very slow.

The next segment constitutes soils that are deep silt loam and sandy loam alluvial and organic soils of the Nooksack, Puyallup, Semiahmoo, and Lynden series.

Extending farther eastward and turning southward for several miles into Skagit County, the route would traverse moderately deep and deep loam and sandy loam soils formed in weathered sandstone and shale. Principal series are Cathcart, Heisler, Barnhardt, and Barneston.

The next segment would extend southward to south of Mount Vernon. Principal soils are Puyallup, Puget, and Pilchuck series. These are deep loam, silt loam, and sandy loam soils formed in alluvial and glacial materials. Some of the best agricultural soils of western Washington occur within this part of the route.

Extending southward from Mount Vernon to Arlington the route would comprise soils of Alderwood, Cloquallum, Everett, and Bellingham series. These are moderately deep to deep sandy loam and silt loam soils formed in glacial materials. Topography is nearly level to hilly.

Vegetation would reestablish quickly in disturbed areas. Removal of vegetation on steeper slopes would result in annual soil loss in the range of 15 tons per acre. Erosion loss after revegetation would range from 1 ton per acre per year on the steeper slopes to 0.2 ton per acre per year on more level slopes.

Losses from fugitive dust during construction would be 80 to 100 pounds per acre of right-of-way, depending upon soil texture, soil moisture, and wind velocity. The application of water on the ground surface during construction would reduce this type of soil loss by at least 50 percent. Impacts caused by surface compaction by construction equipment would vary. Soils high in clay content would lose an estimated 5 percent of productive capacity. Coarse-textured and gravelly soils would be affected to a lesser extent.

Natural processes such as shrinking, swelling, freezing, thawing, root growth, and microbiological activity, along with plowing or ripping would return compacted soils to normal in 2 to 3 years.

Efforts to segregate and stockpile the topsoil would reduce profile mixing and dilution by an estimated 95 percent.

Impacts from oil spills would be similar to those described for the prime route (Chapter 3). Greatest impact would be from spills occurring on the nearly level and highly fertile alluvial lands.

## Aquatic Resources

### Physical Components

Nine major and several minor streams would be crossed by the proposed Cherry Point alternative alignment between the tank farm and Arlington. These include the Nooksack, Samish, Skagit, and the North and South Forks of the Stillaguamish. All exhibit seasonal discharge variations and generally have two high flow periods. One can be anticipated in fall or winter during periods of high precipation and the second during the spring when warming temperatures cause snowpack melt. Low flow periods usually occur in late summer. Flows generally are unregulated with the exception of the Samish, Skagit, and Tolt Rivers which have dams upstream of the proposed alignment. Water quality of all streams is Class A (excellent) or Class AA (extraordinary) as established by Washington State Water Quality Standards (WAC 173-201).

Several impacts to surface and ground water would result from construction and operation of the pipeline. Short-term increases of turbidity at and downstream of the river crossings would be expected. Construction during low flow periods, June through November, would minimize impact. Localized areas of shallow or perched ground water would be impacted by pipeline construction. Dewatering of the trench would affect natural ground water movement and sediment laden water could percolate to the water table, degrading water quality.

Hydrostatic test water would be withdrawn from several of the major streams along the pipeline route. Up to a 5 percent reduction of stream flow would be anticipated during withdrawal time.

No major impact from normal operation of the system would be anticipated. However, if a rupture of the pipe occurred oil could reach surface and ground water resources causing long-term water quality degradation. Many of the river crossings are within 5 miles of Puget Sound, so with a pipe rupture, oil would probably enter the marine environment.

Potential for impacts from oil spills on municipal supplies exists near Lake Whatcom.

### Biological Components

The pipeline route between Cherry Point and the proposed route near Arlington would cross approximately 15 streams important for migration, spawning, and rearing of salmon and searun trout. This would be approximately twice as many compared to the number of salmon streams crossed in the proposed route. Resident trout inhabit these streams and several additional streams not accessible to searun fishes. Major streams supporting searun fish populations include the Nooksack, Samish, Skagit and North and South Forks of the Stillaguamish River. Significant spawning areas for salmon and trout occur at the crossing areas on the following streams: Nooksack, Samish, and North and South Forks of the Stillaguamish. Salmon rearing facilities located along this corridor include the Whatcom Creek Rearing Facility and the Samish Hatchery which uses water from both Friday Creek and the Samish River. Hatcheries located upstream from the crossing areas include one on the Nooksack, two on the Stillaguamish and three on the Skagit River system.

Indian fisheries include the Lummi Indian River Fishery immediately downstream from the Nooksack River crossing area, a fishery in the marine waters near the mouth, and a gill net fishery located several miles upstream from the crossing area. The Tulalip Indian Beach Seine Fishery is located in Port Susan and relies partly on fish from the Stillaguamish system.

Reductions of salmon and trout populations would occur as a result of spawning gravel sedimentation. Sediment would come from instream trenching activities during construction and from streambank erosion during project operation. Most of the sediment from instream trenching would be washed out of the spawning gravel during the first period of high flow, but sediment from streambank erosion would continue for several years until revegetation was complete. The greatest reductions of salmon and trout populations would occur during construction and for the first few years of project operation. Several spawning cycles would be required for these populations to return to preproject levels. Reduced trout populations should recover in several years while salmon might take 20 years to fully recover. The initial population reductions during construction would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries, if large numbers of year-class were eliminated. In subsequent years during project operation, population reductions would probably be within the normal range of fluctuations and consequently would not be noticed.

If an oil spill occurs during project operation, trout and salmon populations would be reduced for several miles downstream from the spill site. Several spawning cycles would be required for reduced populations to recover to prespill levels; several years for trout and up to 20 years for salmon. Population reductions would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries, particularly following a large spill. Substantial fish losses would occur if large numbers of upstream, hatchery released juvenile fish are present during an oil spill. An oil spill upstream from the Whatcom Creek Rearing Facility or the Samish Hatchery could cause the loss of all eggs and juvenile fish at those facilities at the time of the spill.

## Marine Resources

### Physical Components

Maximum wave height in the Bellingham area may reach 5.5 feet between October and May. Areas in all parts of the San Juan Islands not exposed to waves from the Strait of Juan de Fuca have maximum wave heights of less than 4 feet. Exposed areas may experience waves and swells of the size prevailing in the strait. Wave heights are less than 2 feet in the Bellingham-San Juan Islands region from June to September (Oceanographic Institute of Washington 1974).

Tidal currents in the San Juan Archipelago can attain very high velocities because of numerous constrictions to tidal flow. Flood currents set northward through Haro Strait and ebb in the opposite direction. Ebb tide usually runs longer and has a higher tidal velocity than flood tide. At the northern entrance to Haro Strait flood tide sets eastward on both sides of Sucia Island and eastward across Alden Bank. Tidal velocities in Haro Strait are 1 to 5 knots (Oceanographic Institute of Washington 1974).

Between Sucia Island and Orcas Island the current develops moderate velocity. Heavy rip tides occur along the middle bank, north of it and around Discovery Island. Heavy, dangerous rip tides are prevalent between East Point and Patos Island and for 2 miles northward in the Strait of Georgia. The tidal currents in the Strait of Georgia are not as strong as those in the channels leading to and from the Strait of Juan de Fuca and current velocities can attain 3 knots at times, especially during the summer freshets (Oceanographic Institute of Washington 1974).

Marine water quality throughout the San Juan Archipelago, Haro and Rosario Straits, and the Strait of Georgia are classified extraordinary (Class AA). Bellingham Bay, Samish and Dilla Bay are considered excellent (Class A). (Washington State Department of Ecology 1977).

Estimated frequencies for oil spills, explosion, and fire associated with Cherry Point as an oil transshipment port are presented in table 9.4-1.

Oil spill trajectories for hypothethical in-transit or at berth oil spills in March and September are given in the Map Addendum. Since the Cherry Point spill site is close to the northern limits of the tidal current and wind boundaries, the trajectory results are very approximate. No estuarine flow sea breeze wind field were included in the model. In March the most probable impact area is the coast from Birch Point to Cherry Point. Southerly transport is possible due to inland high pressure system during this time of year. Under these conditions Orcas Island, Sucio Island, and Matia Island would be impacted. Also, East Point on Saturna Island, Canada would be threatened. Oil spills during September conditions would tend to travel rapidly to the northwest into Canadian waters. If the oil spills do not beach, the possibility exists that they would be entrained by Fraser River runoff. This might result in the spills being transported back into the region. Table 9.4-2 gives the approximate nautical miles of shoreline that might be initially impacted by spills at Cherry Point.

Expressions of probability are useful indicators of future events, but caution must be taken to avoid misinterpretation of these estimated values. "One spill every 'X' years" expresses a calculated rate and does not indicate when the spill may occur. Also, the estimate will remain valid only if conditions do not deviate significantly from historical patterns.

### Biological Components

Marine biological resources in the vicinity of Cherry Point include scallops, intertidal hardshell clams, sport salmon and nonsalmon fishing, commercial salmon gill net and purse seine fishing and commercial otter trawl areas for bottomfish. The distribution of these resources can be in the Map Addendum. To the north of Cherry Point are winter and spring Pacific herring spawning grounds and habitats for waterfowl. To the south are Pacific herring spawning grounds, Dungeness crab beds, and numerous waterfowl nesting and/or roosting habitats.

No major construction impact could be identified for this alternate port site.

During the operation phase chronic at-berth oil spills would degrade the water quality in the vicinity of Cherry Point. As a consequence, those marine resources of sports and commercial values could become tainted by seawater soluble fractions of crude oil.

## TABLE 9.4-1 ESTIMATED FREQUENCIES OF VARIOUS RISKS FOR OIL TRANSSHIPMENT FROM CHERRY POINT TO ARLINGTON

| Risk Involved | Estimated Existing Risks 1/ | Estimated Incremental Risks | | Estimated Combined Risks | | Estimated Incremental Risk for Onshore Pipeline | |
|---|---|---|---|---|---|---|---|
| | One Casualty Every: | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day One Casualty Every: | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day One Casualty Every: | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day One Casualty Every: |
| Oil Spill: | | | | | | | |
| In-Transit (≥2.4 bbls) | 1.2 years (0.7-4.1) | 2.0 years (1.2-7.0) | 1.6 years (0.9-5.3) | 0.75 years (0.44-2.61) | 0.69 years (0.39-2.66) | | |
| At Fixed Berth (≥2.4 bbls) | 0.39 years (0.28-0.65) | 0.67 years (0.48-1.11) | 0.51 years (0.36-0.85) | 0.25 years (0.18-0.41) | 0.22 years (0.16-0.37) | | |
| At Single Point Mooring (≥3.6 bbls) | | | | | | | |
| Bunker Barge (≥2.4 bbls) | 0.27 years (0.17-0.58) | 1.56 years (1.00-3.40) | 1.18 years (0.76-2.58) | | | | |
| Tank Farm 2/ (≥2.4 bbls) | 0.19 years (0.16-0.24) | 0.96 years (0.78-1.3) | 0.59 years (0.48-0.76) | | | | |
| Pipeline 3/ (≥2.4 bbls) | 1.19 years (0.57-XX) | | | | | 6.88 years (3.29-XX) | |
| Explosion: | | | | | | | |
| In-Transit | 31 years | 53 years | 41 years | 26 years | 24 years | | |
| Harbor Area | 37 years | 63 years | 49 years | 24 years | 21 years | | |
| Fire: | | | | | | | |
| In-Transit | 35 years | 59 years | 46 years | 22 years | 20 years | | |
| Harbor Area | 15 years | | | | | | |
| Fire and Explosion | | | | | | | |
| Tank Farm ( $1,000) | | 64 years (42-133) | | | | | |
| Pipeline Station ( $1,000) | | 66 years (50-99) | | | | | |

Source: OIW 1978a,b,c, 1979a

1/ The ranges shown in parenthesis for each throughput are estimates of the 95 percent confidence limits.

2/ The estimated existing risk range shown in parenthesis is an estimate of the 97 percent confidence limit.

3/ The upper confidence limits are unpredictable and are indicated by "XX".

## TABLE 9.4-2 MOST LIKELY REGION OF FIRST OIL IMPACT FROM AN OIL SPILL AT CHERRY POINT

| Spill Site March Conditions | Approximate Nautical Miles of Shoreline | Spill Site September Conditions | Approximate Nautical Miles of Shoreline |
|---|---|---|---|
| Birch Point to Cherry Point | 10.0 | Birch Point to Cherry Point | 10 |
| Point Doughty to Racoon Point | 5.0 | | |
| Patos Island | 2.5 | | |
| Sucia Island | 9.0 | | |
| Matia Island | 2.0 | | |
| | 28.5 | | |
| East Point Suturna Island, Canada | 1.0 | | |

Source: Stewart 1978; Oceanographic Institute of Washington 1978d

A large in-transit or at-berth oil spill would present serious pollution problems in the Strait of Georgia. The oil-spill trajectories indicate that oil would also affect Canadian marine resources. Of significance would be a landfall of the oil at Sucia Island, a state wildlife refuge, and Matia Island, a national wildlife refuge and on the northern coastline of Orca Island. Alden Bank, a harbor seal area, would also be severely impacted. High mortality of herring and marine waterfowl would also be expected.

No significant marine impact would occur if the berths were removed during the abandonment phase.

### Terrestrial Vegetation

The vegetation of the tank farm and pipeline route is within the Willamette-Puget Forest ecoregion. The dominant species include Douglas-fir, western hemlock, big-leaf maple, and red alder. Riparian habitat found along the pipeline corridor include red alder, willow, black cottonwood, and birch as major components.

Assuming the tank farm would be similar to the proposal in acreage requirements about 140 acres of forest would be lost. This acreage would be out of timber production for at least 25 years.

No threatened or endangered plant species are known to occur in the vicinity of this proposed alternative corridor.

### Terrestrial Wildlife

The trumpeter swan, considered a threatened and endangered species by the State of Washington, may occur in the vicinity of Lake Terrell, a wildlife recreation area in the pipeline corridor. Bald eagle nesting sites near Neptune Beach may also be disturbed (Grub 1975).

Pipeline construction and corridor maintenance would cause reduction of waterfowl habitat and would remove 800 acres of wildlife environment along the 66 miles of pipeline. Long-term impacts could include drainage of marsh habitat and result in loss of nesting and staging areas. The proposed storage facilities would remove 80 acres of wildlife habitat.

Long-term effects from construction could be the loss of habitat and highly productive food areas and the possible disruption of a breeding season for species with naturally low reproductive rates.

Terrestrial mammals could also experience adverse effects in the event of pipe rupture and oil spillage. No endangered mammal species are expected to be adversely affected by the project.

### Cultural Resources

The cultural resource sites listed below would potentially be affected by use of Cherry Point and the associated pipeline route segment. There is high potential for discovery of additional archaeological and historical sites along the proposed pipeline corridor especially along the Lummi, Nooksack, Skagit, Pilchuck, and Stillaguamish River Valleys, near Samish Lake and along the smaller stream valleys.

TABLE 9.4-3 CULTURAL RESOURCE SITES, CHERRY POINT ALTERNATIVE

| County | Site Name | Site Type | Approximate Pipeline Mile |
|---|---|---|---|
| Whatcom | 45WH30 | Possible historic site | 3 |
| | 45WH57 | Prehistoric campsite | 11 |
| | 45WH18 | Prehistoric campsite | 12 |
| | 45WH9 | Prehistoric campsite | 12 |
| Skagit | 45SK68 | Type not known | 39 |
| | 45SK90 | Prehistoric campsite | 45 |
| | 45SK117(Avon) | Town with historic structures | 46 |
| | 45SK112(Mt.Vernon) | Town with historic structures | 47 |
| | 45SK40 | Shell mound | 50 |
| | 45SK64 | Shell mound | 50 |
| | 45SK65 | Prehistoric artifact locality | 51 |
| | 45SK41 | Shell mound | 51 |

Potential impacts to sites would be the same as those discussed in Chapter 3.

### Visual Resources

The onshore storage facility would cause high visual impact for the short-term that would diminish as it blended into the existing oil-related industrial complex.

The construction of a 42-inch pipeline, paralleling the existing 20-inch Trans Mountain pipeline, from Cherry Point to a point near Arlington, would cause moderate visual impact as it traversed the mixed urban, suburban community. Impacts during the operation phase would diminish and be low for the life of the project. An oil spill of any magnitude within the Sound would have severe impacts on visual resources such as estuaries and beaches.

### Land Use

Existing land use at Cherry Point is dominated by the Mobil and Arco oil refineries. In the surrounding area there is an extensive patchwork of small farms. Whatcom County has applied a "general protections" zoning designation to the area; the comprehensive plan designates the area as "primary industrial." The port facility would be consistent with existing, zoned and planned land uses. No significant impacts are likely to occur.

The pipeline route to the Arlington area would involve construction through numerous areas where development has reached densities that must be considered urban. The impacts to the developed land within the construction right-of-way would be essentially as described in chapter 3. The pipeline right-of-way would affect about the same amount of agricultural land and less forest land than the primary route. Impacts to these land uses are not likely to be significant.

Areas with special management concerns include the Lummi Indian Reservation located about 3 miles south of the tanker berthing and onshore storage facilities. The pipeline route, paralleling the Trans Mountain pipeline, would be about a half mile north of the reservation boundary. Significant adverse impacts to the Lummi Reservation would likely occur only in the event of a major oil spill at the tanker berthing facility which could result in oil damage to the reservations, beaches, and agriculture.

### Transportation and Utility Networks

Tanker traffic to the Cherry Point berthing facility would transit the Strait of Juan de Fuca and Rosario Strait before entering the Strait of Georgia where the berths would be located. At 933,000 barrels per day throughput, tanker traffic through Rosario Strait would represent a 42 percent increase over 1976 tanker traffic to Cherry Point refineries assuming that the current 125,000 dead weight tonnage tanker size limit is eliminated. This increase in vessel traffic would significantly increase the risk of a tanker casualty and resulting oil spill.

The Cherry Point area is served by a network of primary and secondary roads that would be adequate for peak traffic conditions which would occur during construction.

Two major rail lines, the Burlington Northern and the Milwaukee railroad provide service to this area. Rail service should be adequate for hauling project materials and no significant impacts to these systems would be expected. The Bellingham International Airport provides commuter air service to the area. It has ample capacity for any air traffic which might be induced.

Electric transmission facilities are present in the area to serve the INTALCO Aluminum Plant, the other refineries and the Trans Mountain pipeline system. Puget Sound Power and Light, a private utility, provides service to this area. Representatives of the company have expressed reluctance to contract additional firm power service because of possible shortages in hydro generation, coupled with delays in getting thermal generation on line. This alternative should require approximately 20 to 25 megawatts per year less power than the proposed route.

## Recreation

No significant impacts to recreational activities are anticipated as a result of normal construction, operation, or abandonment activities associated with the berthing, onshore storage facility, or pipeline system. No developed recreational areas are known to be crossed by the pipeline.

Sport fishing for searun trout and salmon is done on most streams throughout the alternative corridor; angler use at pipeline crossings is not known. Impacts to anglers would be indirect and related to impacts on the fish.

Two rivers which are included in the Washington State Shorelines Management Act of 1971 as "Rivers of Statewide Significance" are crossed by the proposed pipeline; these are the Nooksack (crossed twice) and Skagit Rivers. Trenching activities across these rivers would detract from scenic and recreational uses.

An oil spill at sea would severely impact angling for fin and shellfish, and other Puget Sound marine-related recreational activities because of oil contamination. See map section II (map addendum) for location of recreation related marine resources.

Preliminary risk analysis studies indicate that an oil spill off Cherry Point would affect sport salmon fishing north of Orcas Island. Nonsalmon sport fishing would be impacted from Boundary Bay to the vicinity of Orcas Island. Area shellfish beds would be contaminated by the oil and could take an estimated 4 to 10 years to recover before recreational collection could resume. Area utilization is not significant. A recreational home development in the Birch Bay vicinity would be damaged by oil polluted beaches and loss of visual quality. A minimum of 20 shoreside recreational parks and marinas could be impacted. Oil-fouled gear and boats and diminished recreational suitability could affect an estimated 80,000 to 160,000 recreationists if a spill occurred between June and August, curtailing use for 30 days.

## Social and Economic Conditions

The Cherry Point alternative would affect Whatcom, Skagit, and Snohomish Counties. The area is largely urban and industrial, with oil-related industries currently operating. Urban areas include Bellingham, which is 12 miles from the proposed port facility, Anacortes, Mount Vernon, Everett, and Seattle-Tacoma.

Population increases would be small in Whatcom and Skagit Counties. Construction would bring 600 people to Whatcom County and 130 to Skagit County. That would represent increases over the projected 1980 population (100,200 and 57,600) of 0.6 percent and 0.2 percent respectively. It is estimated that about 165 people would move to Whatcom County and 35 to Skagit County during operation.

Population increases along the route to Arlington would be small and short-term. Most workers would be expected to reside in the large urban areas, and could be accommodated there. The increase in personal income from construction would be $18.4 million (1977 dollars) in Whatcom County, an increase of about 3.5 percent.

In Skagit County the increase in personal income would be $5.2 million, about 1 1/2 percent. Assessed value in Whatcom County would increase by about $92 million because of the port and pipeline facilities. That would be an increase of 5.6 percent over the 1977 assessed value of $1,653 million. Skagit County would realize an increase of $6 million from the pipeline, an 0.6 percent increase over 1977 county valuation.

No major impacts would be expected on community infrastructures. The housing market would be strained in Whatcom and Skagit Counties during construction, but workers could probably be accommodated. If a planned nuclear plant were under construction concurrently with the port construction, housing impacts would increase. Schools would also be strained since they are currently operating at capacity. These impacts would be low and short-term. Since the area already has a heavy industrial worker base, local residents are accustomed to the type of activity the project would entail.

## BURROWS BAY

### Description

This alternative considers a terminal at Burrows Bay, where all crude arriving by tanker would be unloaded and moved by pipeline to the onshore storage facilities (figure 9.4-4). The location of a port at Burrows Bay would entail the construction of a sea island type berth, a marine pipeline to shore, and a tank farm of 10-day storage capacity.

Construction would entail underwater work to seat pylons for the berth and installation of a 7,000-foot long submarine pipeline causing some sea bottom alteration. Irreversible shoreline alterations would be related to pumping facilities, pipeline location, and siting of a tank farm. The laying of a 7-mile pipeline across Fidalgo Island would require road and powerline construction. The pipeline would not cross any major rivers, but would cross two creeks.

The pipeline would continue east to Arlington, Washington, joining the proposed route.

Construction of a transshipment port at Burrows Bay is prevented by an amendment to The Marine Mammal Protection Act (Public Law 95-136, 1977).

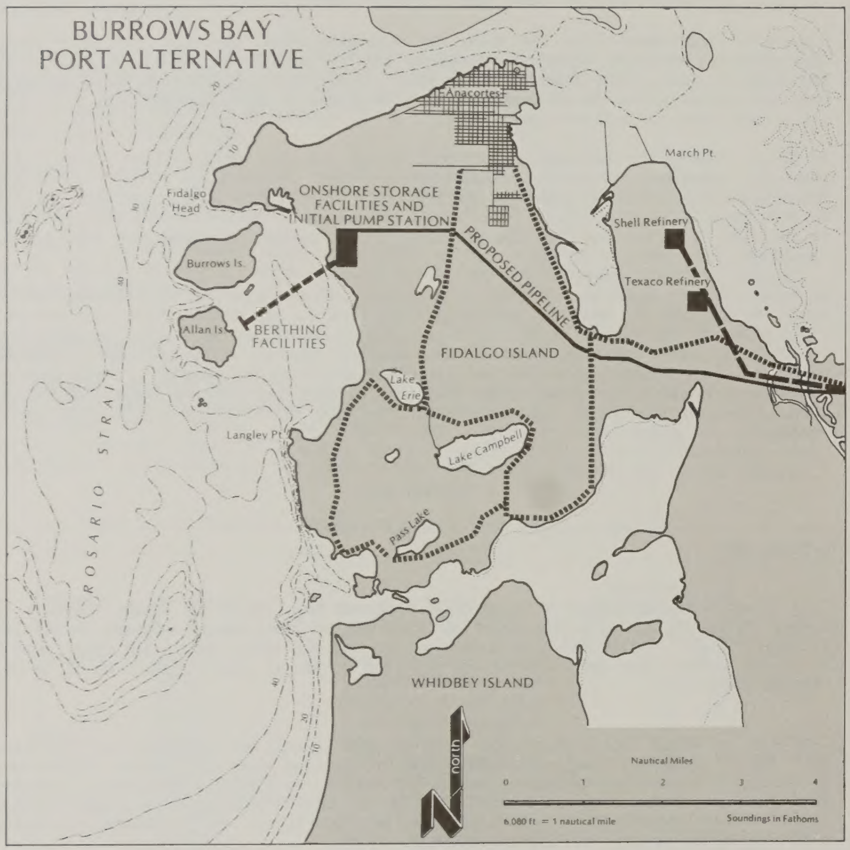


Figure 9.4-4

Northern Tier Pipeline Company

## Climate and Air Quality

No impacts on climate are anticipated for this alternative port site.

Dispersion conditions for air pollutants in the Burrows Bay area are generally good. Winds are predominantly either from westerly directions or from directions between east and south-southeast. Westerly winds are most common in summer, whereas westerly winds are more common in winter. Neutral or unstable atmospheric conditions exist about 70 percent of the time. Stable conditions occur about 30 percent of the time. There is little data available on vertical temperature profiles or temperature inversions.

Existing industrial emission sources in the vicinity of the alternative port site include two refineries, which emit significant quantities of sulfur dioxide, nitrogen oxides, particulates, and hydrocarbons. Air quality data taken at Anacortes and nearby March Point indicate, however, that sulfur dioxide concentrations are well within federal and state standards. Results of air quality modeling performed by SAI (1978) for this alternative port site are given below.

The sulfur dioxide modeling results indicate that 24-hour, Class II incremental standard would not be exceeded if a 1.0 percent maximum sulfur content for bunker fuel were used. The highest calculated annual average concentration would be 5.0 ug/m$^3$, which is 25 percent of the maximum allowable Class II increment.

Calculations for existing sources and tanker emissions resulted in concentrations of 278 ug/m$^3$, 229 ug/m$^3$, and 115 ug/m$^3$ for the maximum 1-hour, 3-hour, and 24-hour sulfur dioxide average concentrations, respectively. These are well within the federal and state air quality standards. The contribution to sulfur dioxide concentrations from the tankers alone would be considerably lower. The highest calculated annual average sulfur concentration is 16.0 ug/m3 for existing sources only, and 18.0 ug/m3 for the combined impact of existing and proposed sources. Thus the increase in sulfur dioxide concentrations would be relatively small. The concentrations would be well within the State of Washington Air Quality Standard of 53 ug/m3.

The maximum 24-hour average particulate concentration caused by this alternate port is 4.7 ug/m3. This is well within the Class II increment of 37 ug/m$^3$. The annual average concentration is estimated to be less than 1 ug/m$^3$, which is well within the Class II incremental standard of 19 ug/m$^3$.

The highest annual average concentration of nitrogen oxides, combining effects of proposed sources and existing sources, is 2.0 ug/m$^3$. This compares with a value of 1.8 ug/m$^3$, if only existing sources are considered. Thus the increase in levels of nitrogen oxides from this alternate proposal would be relatively small.

There was no ozone modeling performed for this alternative port site. However, since project emissions at the Burrows Bay site would be similar to those at Port Angeles, ozone impacts would be about the same as for the Port Angeles site (SAI 1978). Little change in ozone concentrations would occur in the vicinity of the berthing facilities. Ozone concentrations downwind of the onshore storage facilities might be increased by about 10 percent above background levels when conditions were favorable for ozone formation. However, it is not likely that this increase would cause any violation of the Federal ozone standard.

for ozone formation. However, it is not likely that this increase would cause any violation of the Federal ozone standard.

## Noise

The construction of the berthing facilities and submarines pipeline would result in a noticeable increase in noise experienced by residents nearest the shoreline. Highest noise levels would occur during pile driving operations. Noise would be mostly confined to daytime hours.

Construction of the onshore storage facilities would cause daytime noise levels of between 60 and 70 dBA at residences nearest the construction site. Noise would be mainly limited to daytime hours.

Construction of the pipeline would cause noise levels of up to 65 dBA for residences located within 1,000 feet of the alignment. The most intense noise would occur over a period of about 5 days, and would be mainly limited to daytime hours.

During the operation phase the primary noise source would be electric pump station motors. Noise levels would be about 58 dBA at a distance of 400 feet. To some nearby residences, this might represent a slight increase above background noise levels.

## Topography and Geology

This port segment alternative is characterized by moderate to steep terrain at Burrows Bay (Burrows Bay pipeline mile 0 to 7) and relatively gentle terrain for the remaining 31 miles to Arlington. While the proposed port and pipeline route would not encounter quite as much steep terrain, it would involve a 20+ mile submarine crossing, which results in more disturbed acreage than on dry land. Consequently, topographic impacts--minor landform changes and drainage alterations--would be slightly greater along the proposed route and at the proposed port.

Geologic material encountered at this alternate port site would consist of hard, dense, crystalline rock and upper Mesozoic sedimentary and volcanic rocks and the pipeline route would encounter Quaternary glacial and alluvial material with some outcrops of Tertiary sedimentary rocks. While the geologic material encountered at the proposed port and along the proposed pipeline would not be exactly the same as the Burrows Bay-Arlington alternative, geologic impacts would be similar and would consist of the excavation of large volumes of geologic material and some excavation-induced (including blasting) changes in the physical characteristics of the material (e.g., inherent rock strength, porosity and permeability). However, as the proposed route would involve a marine crossing, substantially more geologic material would be excavated and the resultant impacts would be slightly greater.

### Geologic Hazards

Slope instability and seismicity would be the only geologic hazards that would be encountered at this port alternative and pipeline route.

This alternate port and pipeline route segment alternative, like the proposed port and pipeline route, is located in an area of moderate to high seismic activity that corresponds to a Seismic Risk Zone 3 (maximum earthquake damage expected). However, no known active or potentially active faults or large magnitude earthquakes (6+ on the Richter scale) have been identified within 25 miles of this alternate port site and pipeline. While no large magnitude earthquakes have occurred within 25 miles of the proposed port or pipeline, the region has recorded a higher level of seismicity than the region around Burrows Bay. In addition, an inferred potentially active fault has been identified within 2 miles of the proposed port site and the geologic material at the proposed site, being weaker and less consolidated than the material at Burrows Bay, is less seismically stable. Consequently, the overall impacts from earthquakes would be greater at the Port Angeles port site and along its pipeline than at the Burrows Bay alternate port and pipeline.

As the Burrows Bay site is composed of crystalline rock, the harbor bottom has a very gentle gradient (less than 1 percent) and the pipeline would cross relatively gentle terrain, no slope instability problems have been identified. Consequently, impacts would be much less than at the proposed port site at Port Angeles and along the proposed pipeline route.

### Mineral Resources

No significant difference in impacts.

## Soils

The potential site would be composed of loamy soils that are mostly shallow, very rocky, and overlying serpentine bedrock. Slopes range from strongly sloping to steep. Removal of vegetation on the steep slopes would result in potential soil losses of 8 to 10 tons per acre per year, if mitigation measures such as drainage diversion channels and sedimentation ponds are used. Soil losses after revegetation would be reduced to about 0.50 tons per acre per year.

Soil compaction by construction vehicles would reduce soil productivity by an estimated 5 percent and would persist for about 2 years after construction.

Topsoil segregation would reduce impacts from profile mixing. Permanent loss of fertility would be 5 to 10 percent. Natural fertility of soils within the site is low.

Soils in western Washington for the most part are deficient in nutrients because of leaching by precipitation. Vegetation would reestablish quickly in disturbed areas. Removal of vegetation on the steeper slopes would cause soil losses of approximately 15 tons per acre per year. Annual soil losses on lesser slopes would be in the range of 2 to 4 tons per acre. Erosion after revegetation would range from 1.00 tons per acre per year on the steeper slopes to 0.20 tons per acre per year on the more level slopes. Losses from fugitive dust during construction would be 80 to 100 pounds per acre of right-of-way, depending upon soil texture, soil moisture, and wind velocity. The application of water on the ground surface during construction would reduce this type of soil loss by at least 50 percent.

Surface compaction by construction equipment would have varying degrees of impact. Silt loam and silty clay loam textures would lose an estimated 5 percent productive capacity. Coarser textures and gravelly soils would be affected to a lesser extent. Natural weathering and biological processes, along with plowing or ripping would return compacted soils to normal in 2 to 3 years.

Some profile mixing would occur regardless of efforts to segregate and stockpile the topsoil. Estimated loss of fertility would be 5 percent.

Oil spill impacts would be similar to those described for the prime route. Greatest impact would be on the more fertile, nearly level alluvial lands in the southern part of the segment.

## Aquatic Resources

### Physical Components

Two major and several minor streams would be crossed by the pipeline between Burrows Bay and Arlington. These include the Skagit and North Fork of the Stillaquamish River. Seasonal variation of river flow could be anticipated for all the east Puget Sound rivers. High flow periods generally occur in late fall or early winter and again in spring. Low flows generally occur between March and November. Flows generally are unregulated with the exception of the Skagit River which has a dam upstream of the proposed crossing. Water quality of streams along the alignment are Class A (excellent) or Class AA (extraordinary) by Washington State Water Quality Standards.

Construction and operation of the pipeline would impact surface and ground water resources. Short-term increases of turbidity at and downstream of the river crossing would occur. Construction during low flow would minimize impact. Localized perched and shallow ground water regions would be affected by pipeline construction. Dewatering of the trench would affect natural ground water movement, and sediment laden water would percolate to the water table, degrading water quality. Hydrostatic test water would be withdrawn from one or several rivers along the alignment. Base flow of the stream during withdrawal periods would be reduced 1 to 5 percent. No major impact from normal operation of the system would be anticipated. However, if pipeline rupture should occur oil would be released to surface and/or ground water resources degrading water quality. Most river crossings are within 20 miles of Puget Sound, so potential for spilled oil reaching the marine environment exists. Municipal ground water supplies near the towns of Stanwood and Hartford would be affected.

### Biological Components

The pipeline route between Burrows Bay and Arlington would cross seven streams important for migration, spawning, and rearing of salmon and searun trout. This would be fewer than the number of salmon streams crossed in the proposed route. Resident trout also occur in these streams and in several additional streams not accessible to searun fishes. Major streams supporting searun fish populations include the Skagit and North Fork of the Stillaguamish River. Significant spawning areas for salmon and trout occur at the crossing areas on the North Fork of the Stillaguamish River. Hatcheries located upstream from the crossing areas include two on the Stillaguamish and three on the Skagit River system. The Tulalip Indian Beach Seine Fishery located in Port Susan harvests fish from the Stillaguamish River system. Sport angling for salmon and trout occurs on most streams throughout the region.

Reductions of salmon and trout populations would result from sedimentation of spawning gravel. Sediment would come from upstream trenching activities during construction and from streambank erosion during project operation. Most of the sediment from instream trenching would be washed out of the spawning gravel during the first period of high flow, but sediment arising from streambank erosion would continue for several years. The greatest reductions to salmon and trout populations would occur during construction and for the first few years of project operation. Several spawning cycles would be required for these populations to recover to preproject levels. Reduced trout populations should recover in several years while salmon might take 20 years to fully recover. The population reductions because of construction would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries if large numbers of one year-classes were eliminated. During project operation, reductions would probably be within the normal range of population fluctuations and consequently would not be noticed.

Fish populations would be reduced if an oil spill occurred during project operation. Trout and salmon populations would be reduced for several miles downstream from the spill site. Several spawning cycles would be required for reduced populations to recover to prespill levels; several years for trout and up to 20 years for salmon. Population reductions would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries, particularly following a large spill. Substantial fish losses would occur if large numbers of upstream, hatchery released juvenile fish were present during an oil spill.

## Marine Resources

### Physical Components

Entrance to Burrows Bay can be achieved through channels between Fidalgo Head and Burrows Island (controlling depth of 90 feet); between Burrows Island and Allan Island (controlling depth of 108 feet); between Allan Island and Williamson Rocks (controlling depth of 198 feet); or between Williamson Rocks and Langley Point (controlling depth of 196 feet).

Between October and May, areas sheltered from the Strait of Juan de Fuca would experience maximum wave heights of less than 4 feet. Exposed areas might experience waves prevalent in the eastern Strait of Juan de Fuca. The tidal currents and tidal ranges within Burrows Bay would be similar to those at the entrance to Rosario Strait and in the Strait of Juan de Fuca. Currents may attain speeds of 2 to 5 knots varying with the tidal range and the influence of wind (Oceanographic Institute at Washington 1974).

Water quality at the entrance to Rosario Strait and within Burrows Bay is extraordinary (Class AA) (Washington State Department of Ecology 1977).

Estimates of existing, incremental, and combined oil spill risks and explosion and fire risks, associated with Burrows Bay, for various transshipment operations are presented in table 9.4-4. The pipeline risks are for combined offshore and offshore pipeline to Arlington. Further risk dicussion can be found in chapter 3.

Tankers approaching Burrows Bay, via the north bound traffic lane, must pass over a rapidly shoaling area between Point Colville and Lawson Reef. It is in this shoaling area that a hypothetical in-transit tanker grounding is considered to occur in March and September. The oil-spill trajectories for these two hypothetical incidences are shown in the Map Addendum. Shorelines that could initially be impacted during a March oil spill are Allans Island, Burrows Bay, Iceberg Point to Decatur Head, and Smith Island. A September oil spill could initially impact Allan Island, Burrows Island, and Iceberg Point to Decatur Head.

The hypothetical oil spill trajectories for in-transit casualties off Langley Point, Fidalgo Island, in March during spring and neap tidal conditions, are shown in figures 9.4-5 and 9.4-6. The oil spill trajectories during a spring tide indicate that Allan Island would be impacted in 6 hours, and Burrows Island and Flounder Bay would be impacted within 10 hours. A similar in-transit oil spill during neap tidal conditions would impact Flounder Bay within 2 hours and the coastline of Fidalgo Island from Flounder Bay to Langley Point between 3 to 8 hours.

## Biological Conditions

Marine habitats found in Burrows Bay are eelgrass beds, rock, mud, and open ocean. Waterfowl are numerous and the salmon population is high. In the northern part and southern entrance of the bay commercial purse seine fisheries are concentrated. Salmon gill net fishing is concentrated only in the southern approach. Sport salmon fishing is found throughout the bay and bottom fishing can be found around Allan and Burrows Islands and in all passages into the bay. Shrimp are also found within the bay. The general distribution of these resources in Burrows Bay and adjacent Rosario Strait and Strait of Juan de Fuca can be found on maps (Map Addendum).

Specific locations of marine waterfowl and mammal poplulations in the vicinity of Burrows Bay are shown in Map Addendum.

During the construction of the submarine pipeline, degradation of marine water quality would occur within Burrows Bay, the entrance to Rosario Strait and the eastern portion of the Strait of Juan de Fuca. Suspended solids, organic debris, heavy trace metals, chlorinated hydrocarbons would all contribute to this degradation. Details on construction impact of submarine pipeline construction can be found in chapter 3.

Chronic oil spills would be expected during in-transit and at-berth operations. Such spills would degrade the water quality in the bay and the adjacent straits. A pipeline rupture would have a severe impact upon the Bay, the San Juan Archipelago, and Whidbey Island. Water Quality in the northeastern part of the Strait of Juan de Fuca and throughout Rosario Strait would be degraded for the duration of the spill. Specific information on effects of crude oil can be found in chapter 3.

TABLE 9.4-4 ESTIMATED FREQUENCIES OF VARIOUS RISK FOR OIL TRANSSHIPMENT FROM BURROWS BAY TO ARLINGTON

| Risk Involved | Estimated Existing Risk 1/ | Incremental Risk | | Combined Risk | |
|---|---|---|---|---|---|
| | | 709,000 bbls/day | 933,000 bbls/day | 709,000 bbls/day | 933,000 bbls/day |
| | One Casualty Every: | One Casualty Every: | | One Casualty Every: | |
| Oil Spill: | | | | | |
| In-Transit (≥2.4 bbls) | 1.2 years (0.7-4.1) | 2.5 years (1.2-7.0) | 1.6 years (0.9-5.3) | 0.81 years (0.48-2.80) | 0.74 years (0.43-2.54) |
| At-Fixed Berth (≥2.4 bbls) | 0.39 years (0.28-0.65) | 0.67 years (0.48-1.12) | 0.51 years (0.36-0.85) | 0.25 years (0.18-0.41) | 0.22 years (0.16-0.37) |
| Bunker Barge (≥2.4 bbls) | 0.27 years (0.17-0.58) | 1.56 years (1.00-3.40) | 1.18 years (0.76-2.58) | | |
| Tank Farm 2/ (≥2.4 bbls) | 0.19 years (0.16-0.24) | 0.96 years (0.78-1.3) | 0.59 years (0.48-0.76) | | |
| Pipeline 3/ (≥2.4 bbls) | 1.19 years (0.57-XX) | 4.5 years (2.2-XX) | | | |
| Explosion: | | | | | |
| In-Transit | ~31 years | ~66 years | ~48 years | ~21 years | ~19 years |
| Harbor Area | ~37 years | ~63 years | ~49 years | ~24 years | ~21 years |
| Fire: | | | | | |
| In-Transit | ~35 years | ~74 years | ~55 years | ~24 years | ~21 years |
| Harbor Area | ~15 years | | | | |
| Fire and Explosion: | | | | | |
| Tank Farm (≥$1,000) | | 64 years (42-133) | | | |
| Pipeline Station (≥$1,000) | | 66 years (50-99) | | | |

Source: OIW 1978 a, b, c, 1979a

1/ The ranges shown in parenthesis for each throughput are estimates of the 95 percent confidence limits.

2/ The extimated existing risk range shown in parenthesis is an estimate of the 97 percent confidence limit.

3/ The upper confidence limits are unpredictable and are indicated by "XX".

Burrows Bay Oil Trajectories
March 1976, Neap Tide

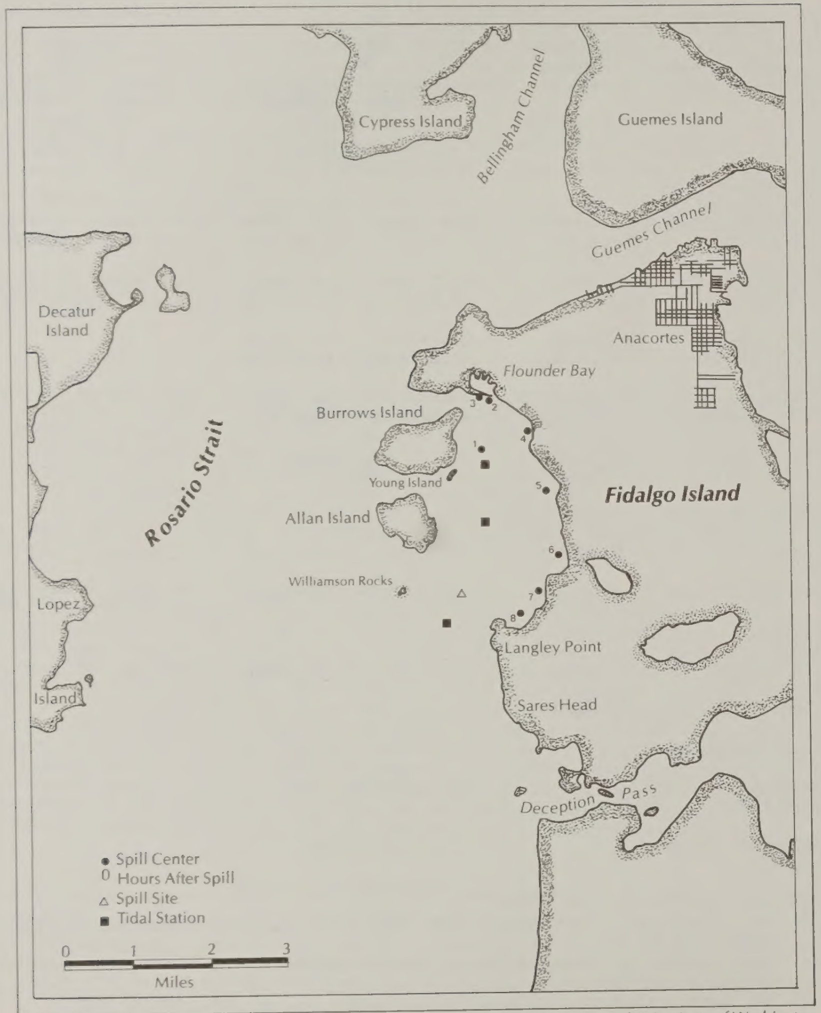


Figure 9.4-5

Source: Oceanographic Institute of Washington

Burrows Bay Oil Trajectories
March 1976, Spring Tide

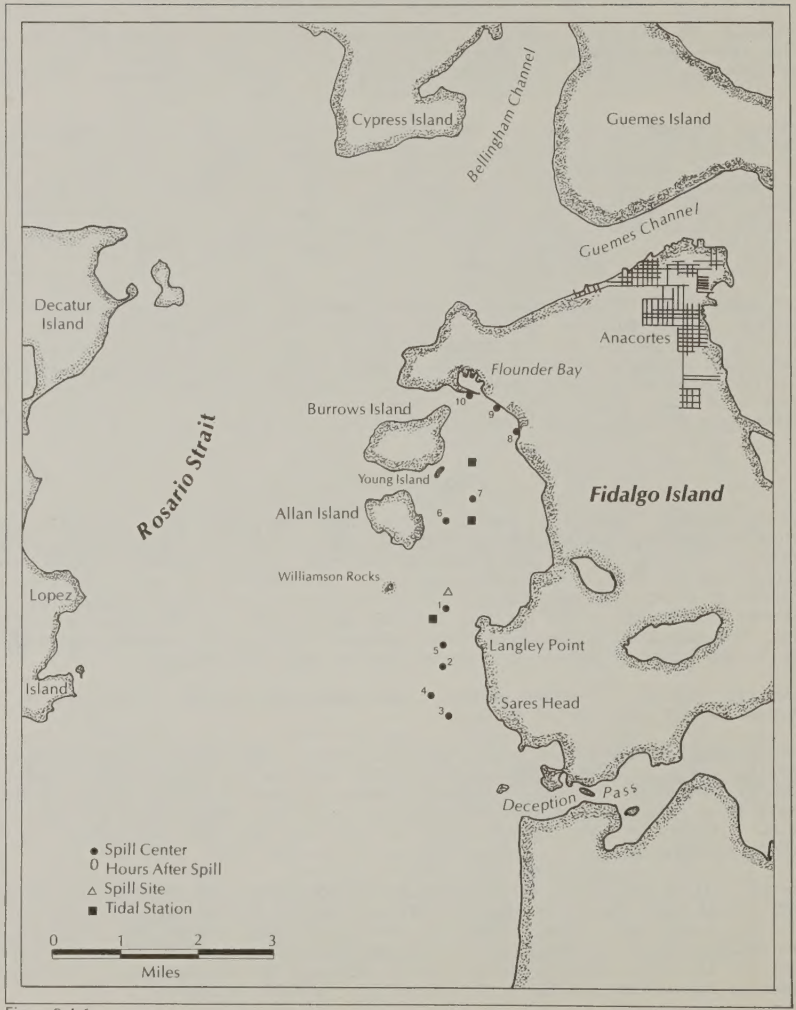


Figure 9.4-6

Source: Oceanographic Institute of Washington

### Terrestrial Vegetation

The vegetation of the storage facility and along the pipeline corridor is in the Willamette--Puget Forest ecoregion. The dominant overstory components include Douglas-fir, western hemlock, big-leaf maple, and red alder.

No endangered or threatened plant species are known to occur within the storage facility or pipeline corridor.

### Terrestrial Wildlife

Migratory waterfowl and other birds using the Pacific flyway would be impacted by the disturbance of staging areas and alteration of wildlife habitat. The pipeline would remove vegetation from approximately 460 acres including potential nesting and roosting areas for endangered species e.g., bald eagles and peregrine falcons. Oil spills could also impact the habitat used for waterfowl breeding and nesting.

### Cultural Resources

The cultural resource sites showin in table 9.4-5 would potentially be affected if this proposed port alternative and pipeline route segment were used. There is high potential for discovery of additional archaeological and historical sites in the proposed construction areas, especially along the shoreline and the Skagit, Pilchuck, and Stillaguamish River valleys. Potential impacts to these sites would be the same as those discussed in Chapter 3.

### Visual Resources

The Burrows Bay alternative is located in an inlet sheltered by Burrows Island and Allan Island to the west. The berthing facilities are planned for the northeast side of Allan Island with submarine pipelines to Fidalgo Island 1/2 mile northwest of Alexander Beach. There would be a tank farm at Fidalgo Island. Assuming that the shoreline across which these submarine pipelines would ascend to the tank farms is a low, rocky cliff, or at best gravelly sand-soil composite, a high visual impact would be evident, especially during construction. It would persist beyond the life of the project.

High visual impacts could result during construction, if dredging is necessary to deepen the berthing facilities for large tankers. The berthing and unloading operation should cause little impact because of its distance from the shoreline. Tankers are common in the area.

The onshore tank farm would require approximately 140 acres and could have high visual impact during construction because of dust emissions. Because of the present oil-related industry in the area, the addition of a tank farm would have minor impacts on the existing scene.

### Land Use

At Burrows Bay the port and onshore storage facility would introduce an industrial land use to the relatively undeveloped coastline. The alternative would result in more urban growth near Anacortes than the NTPC proposal would in Port Angeles. The conversion of existing land uses to project use might be viewed as more severe in view of the more limited availability of land. The project might not be consistent with the County Shoreline Master Program. The pipeline route would cross about 1/2 mile of tidelands at the end of Padilla Bay, claimed by the Swinomish Indians to be part of their reservation. The various land uses affected by the pipeline route would be in the same proportion as the Cherry Point alternative and the impacts would be comparable.

TABLE 9.4-5 CULTURAL RESOURCES--BURROWS BAY ALTERNATIVE

| County | Site Name | Site Type | Approximate Location |
|---|---|---|---|
| Skagit | 45SK16 | Shell midden | On Allan Island |
| | Burrows Island light station* | Historic lighthouse | On Burrows Island |
| | 45SK42 | Shell mound | On Fidalgo Bay |
| | 45SK43 | Shell mound | On Fidalgo Bay |
| | 45SK45 | Shell mound | On Fidalgo Bay |
| | 45SK 1 | Shell mound | On Similk Bay |
| | 45SK17 | Shell midden cairn and burials | On Similk Bay |
| | 45SK18 | Shell midden | On Similk Bay |
| | 45SK58 | Campsite | Pipeline mile 12 |
| | 45SK67 | Artifact locality and possible trail | Pipeline mile 13 |
| | 45SK90 | Habitation | Pipeline mile 14 |
| | 45SK117 (Avon) | Town with historic structures | Pipeline mile 17 |
| | 45SK112 (Mt. Vernon) | Town with historic structures | Pipeline mile 18 |
| | 45SK40 | Shell mound | Pipeline mile 21 |
| | 45SK64 | Shell mound | Pipeline mile 21 |
| | 45SK65 | Prehistoric artifact locality | Pipeline mile 22 |
| | 45SK41 | Shell mound | Pipeline mile 22 |

*Listed in National Register of Historic Places.

### Transportation and Utility Networks

Because of its closeness to the Strait of Juan de Fuca, Burrows Bay would likely have less navigation risk than Cherry Point. Vessel traffic congestion would not likely be a problem.

Highway access to Burrows Bay is limited to a 2-lane roadway from Anacortes. Construction traffic would cause significant lowering of service levels on roadways and in nearby Anacortes where the nearest railroad is located. Traffic congestion would probably be more severe than in Port Angeles as described in chapter 3.

Electric power requirements would be similar to the Cherry Point alternative and would have a comparable potential impact in terms of regional electric power supplies.

## Recreation

No significant impacts to recreational activities are anticipated as a result of normal construction or abandonment activities associated with the berthing, submarine pipeline, or connecting pipeline system. The Skagit River pipeline crossing occurs in an area designated for high scenic and recreational values (Shoreline Management Act 1971). An oil spill in Puget Sound and pipeline leaks or ruptures would curtail recreational activities for the period of contamination. Bottom and salmon fishing in Burrows Bay, recreational shrimping and scuba diving are some of the activities which could be affected. Preliminary studies indicate that if a tanker oil-spill incident occurred at the entrance to Rosario Strait, it could impact sport salmon fishing south of Lopez Island and offshore Whidbey Island. Nonsalmon sport fishing south of Lopez Island and along Whidbey Island could be impacted for the short-term. Casual recreational marine pursuits would be lost for the short-term and a significant number of recreationists affected if a spill occurred during the summer season. Oil fouling of gear and boats would be the most critical impact. For locations of area recreational activities, see the Map Addendum.

## Social and Economic Conditions

The counties which would be affected by this alternative are Skagit and Island; they would be most impacted by port construction. Snohomish County would be impacted by pipeline construction. Whatcom County would also be expected to have impacts.

During construction, population increases would be less than 1 percent over the projected 1980 figures. Skagit County would have an increase of 540 people, Island would increase by 130, Whatcom by 260, and Snohomish by 610. During operation Skagit County would increase by 100 people, Island by 35, Whatcom by 50, and Snohomish by 15. Population increases would be less significant than those expected for the primary proposal.

Increases in personal income are listed in table 9.4-6.

These increases would be positive but not significant impacts for the four counties.

Assessed value in Skagit County would increase by $98 million dollars because of the port facilities. This represents a 9 percent increase over the 1977 valuation for the county.

Housing stocks are presently limited in Skagit and Island Counties. Impacts on housing would probably be low during construction because workers could find accommodations in neighboring areas within commuting distance.

Most of the schools in the area are presently operating above capacity, and would be further strained by additional students brought in by the project. Skagit County would have an estimated 90 additional students during construction. Ninety more students would be distributed over the schools in Island, Whatcom, and Snohomish Counties during construction.

TABLE 9.4-6 INCREASE IN PERSONAL INCOME

| County | | Increase in Personal Income ($Millions) | Change at Annual Rates (1977 Dollars) (Percent) |
|---|---|---|---|
| Skagit | Construction | 13.6 | 4.0 |
| | Operation | 1.0 | 0.3 |
| Island | Construction | 3.7 | 2.2 |
| | Operation | 0.4 | 0.2 |
| Whatcom | Construction | 9.1 | 3.1 |
| | Operation | 0.5 | 0.1 |
| Snohomish | Construction | 21.1 | 1.3 |
| | Operation | 0.2 | NC |

N.C. = Negligible change

Oak Harbor in Island County would experience strain on its fire, police, and medical facilities during construction. Fire protection in Anacortes (Skagit County), the nearest city to the port facilities, would be insufficient to handle port-related emergencies during operation of the system. Other community services would not be significantly impacted.

The impacts of the Burrows Bay alternative could be drastically increased if a nuclear power plant which is planned near Sedro-Wooley were under construction at the same time as the port. The plant is tentatively scheduled for construction beginning in 1979, but could be delayed to 1982.

# FRESHWATER BAY

## Description

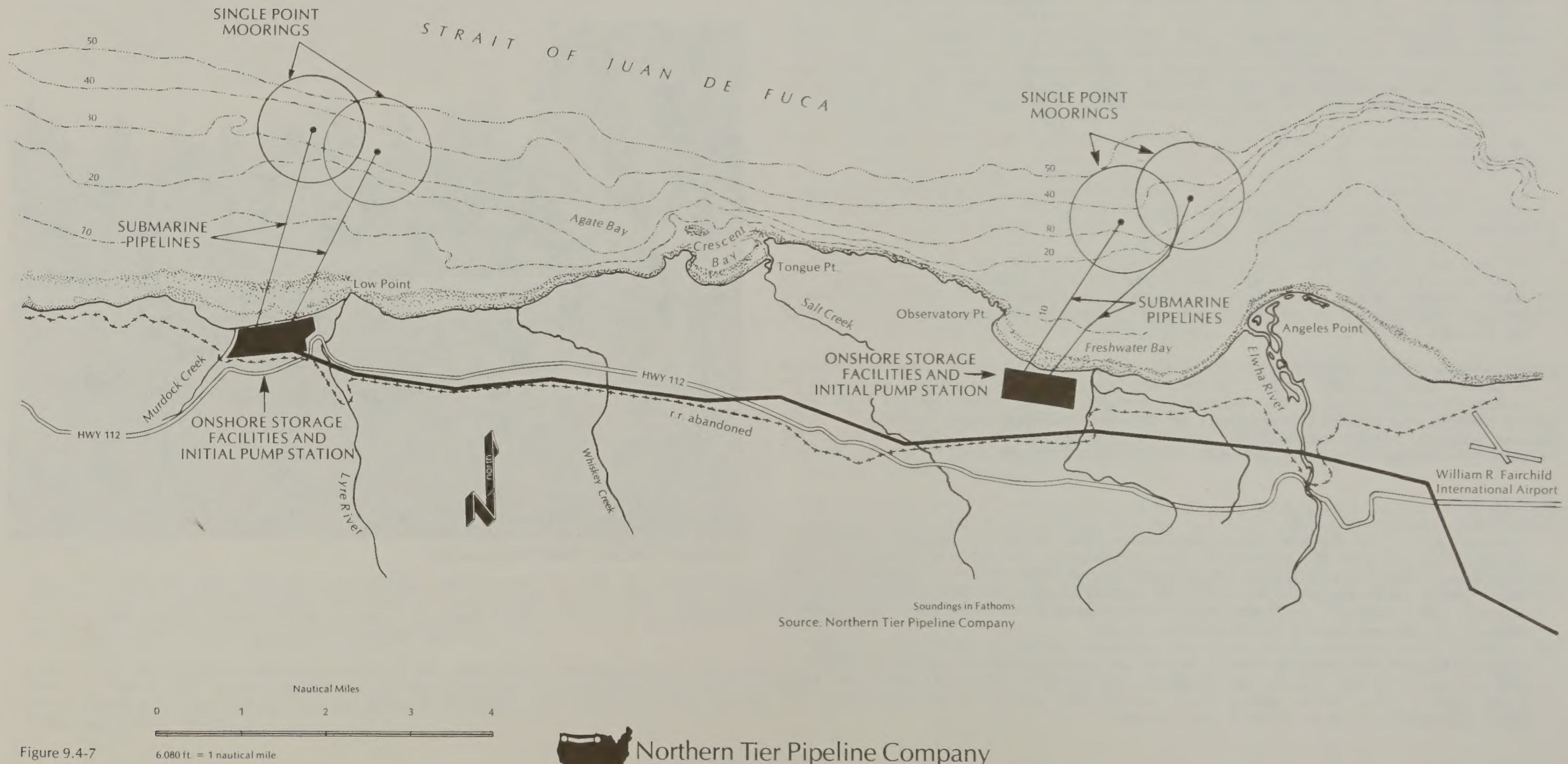
Freshwater Bay (figure 9.4-7), approximately 6 miles west of Port Angeles, would require two single point mooring (SPM) systems for offloading crude oil from tankers. Suitable water depths of 210 feet (35 fathoms) are only available about 10,000 feet offshore. The minimum water depth for the tankers swinging toward the shoreline would be 90 feet (15 fathoms). Onshore storage and pumping facilities would be located on land near Freshwater Bay. Seventeen miles of pipeline would be required to reach Green Point.

## Climate and Air Quality

No impacts on climate are anticipated for this alternative port site.

## LOW POINT PORT ALTERNATIVE

## FRESHWATER BAY PORT ALTERNATIVE



Soundings in Fathoms

Source: Northern Tier Pipeline Company

Figure 9.4-7

Northern Tier Pipeline Company

Freshwater Bay is located in rural surroundings and there are no large pollution sources in the immediate area. Some significant industrial pollution sources occur in Port Angeles, about 6 miles east of Freshwater Bay. There are no air quality data available for Freshwater Bay. However, background concentrations are expected to be relatively low due to the prevailing westerly winds which would tend to blow pollutants from Port Angeles away from the area.

A limited modeling study was performed by Science Applications, Inc. (SAI 1978). However, in the absence of meteorological data at Freshwater Bay, data for Port Angeles had to be used. Since these data may not be necessarily representative for Freshwater Bay, the modeling results would have to be interpreted with caution. This analysis assumes that the tankers would burn fuel with a sulfur content of 0.45 percent or less while operating in port, as proposed by the applicant. The highest annual average sulfur dioxide concentration for a 933,000 bpd throughput is 2.3 $ug/m^3$, which is 11 percent of the maximum allowable Class II increment. The highest concentration would occur about a mile east of the proposed SPM site. The modeling analysis indicated, however, potential violations of the Class I standards for sulfur dioxide in the Olympic National Park. A more comprehensive study would have to be made, after collecting on-site data, to determine whether the Class I standards would be met.

Calculated maximum 1-hour, 3-hour, and 24-hour average sulfur dioxide concentrations are well within the Federal and state ambient air quality standards, as well as the Class II incremental standards.

The maximum 24-hour average particulate concentration from the proposed alternative would be 0.8 $ug/m^3$ which is well within the Class II increment of 37 $ug/m^3$. The annual average particulate concentration would be negligible. The highest annual average concentration of nitrogen oxides is 1.2 $ug/m^3$, which is only 1.2 percent of the Federal standard.

No ozone modeling was performed for this alternative port site. However, impacts would be about the same as for the Port Angeles site. Little change in ozone concentrations would occur in the vicinity of the SPM. Ozone concentrations downwind of the onshore storage facilities might be increased slightly above background levels when conditions were favorable for ozone formation. However, it is not likely that this alternative project would cause any violation of the Federal ozone standard.

Olympic National Park Headquarters

## Noise

Construction of the onshore storage facilities would result in daytime noise levels ranging from 50 to 70 dBA at some of the residences in the vicinity of the construction site. This could be a source of annoyance to some of the residents as these noise levels would represent a significant intrusion upon the relatively noise-free existing environment. The relatively dense vegetation in the area would reduce some of the adverse impacts of construction noise.

Construction of the pipeline would result in noise levels of up to 65 dBA at a distance within 1,000 feet of the alignment and up to 50 dBA at distances of about 4,000 feet. These noise levels would be confined mostly to daytime hours, and would generally be sustained for 5 days or less.

During the operation phase, the primary noise would be from the electric onshore storage facility pumps. Noise levels would be generally audible at distances of less than 3,000 feet. The relatively dense vegetation in the area would reduce some of the noise levels.

## Topography and Geology

This alternate port site is characterized by gently northward sloping (4 to 5 percent) terrain, terminating in a moderately steep (up to 50 percent gradient), 50- to 75-foot high coastal bluff; the route segment to Green Point is characterized by relatively gentle terrain intersected by the Elwha River and a number of small streams. Although the proposed port site is located on terrain similar to Freshwater Bay, the need for an additional 17 miles of pipeline would result in a greater overall impact to topography--landform changes and minor drainage alterations.

Geologic materials found at Freshwater Bay and along the 17-mile pipeline to Green Point are similar to those found at the proposed port site and would consist primarily of Quaternary glacial debris. Consequently, impacts to the geologic materials would be similar and would consist of the excavation of large volumes of geologic material and some excavation-induced changes in the physical characteristics of the material (porosity, permeability, inherent rock strength, cementation, etc.). As the volume of material that would be removed at Freshwater Bay is unknown, a comparison of the magnitude of geologic impacts compared to Green Point cannot be made at present.

### Geologic Hazards

Geologic hazards that could be encountered at the port site and along the pipeline route would be seismicity, slope instability, and outburst flooding.

Freshwater Bay and the pipeline route to Port Angeles (Freshwater Bay pipeline mile 0 to 10) is located in an area of moderate to low seismic activity, corresponding to a Seismic Risk Zone 2 (moderate earthquake damage expected); the remainder of the route, to Green Point is located near the western margin of a moderately active seismic area corresponding to a Seismic Risk Zone 3 (maximum earthquake damage expected). Although this alternate port site and much of the pipeline would be within 10 miles of the possibly active Calawah Fault there is no evidence of apparent recent fault movement. Likewise, seismic activity is low at this port alternative. Although seismic activity could result in landslides along the unstable coastal bluffs, the overall anticipated seismic impacts should be less severe than at the proposed port site.

Like the proposed port site at Port Angeles, Freshwater Bay has slope instability problems and a landslide could cause severe damage to the oil terminal facilities. As the slope configuration and the geologic material is similar to the proposed port, anticipated impacts are expected to be about the same.

A potential for outburst flooding occurs at the Elwha River (Freshwater Bay pipeline mile 7), where some damage could occur to the pipeline. As no potential exists at the proposed port site for significant outburst flooding, this alternate would have a higher potential impact.

### Mineral Resources

No significant difference in impacts.

## Soils

Soils in the area of this alternate onshore storage facility are mostly gravelly sandy loams overlying glacial outwash material. The sandy and gravelly profile extends to great depths and is an excellent subgrade material. Rough broken lands rim the site on the north.

The nearly level to gently sloping soils would have a low susceptibility to erosion. Annual soil losses in the forest setting are in the range of 0.04 tons per acre. Removal of vegetation from the site would result in losses of 3 to 4 tons per acre per year. This would be reduced by 60 to 90 percent by use of diversion ditches and settling ponds. Revegetation would further reduce annual soil losses to less than 0.02 tons per acre.

These gravelly and sandy soils would be resistant to topsoil compaction by construction equipment. Loss of productivity would be less than 5 percent and would return to normal in two years.

Soil lost as fugitive dust would be in the range of 1.2 tons per acre for each month of construction, if 1/3 of the area would be undergoing construction at any one time.

Profile mixing and topsoil dilution with subsoils and parent material would be minimized by segregating and stockpiling the topsoils. Long term loss of productivity would amount to no more than 5 percent.

Contamination by oil spills would be restricted by retention dikes around storage tanks.

About 85 percent of the approximately 17-mile proposed pipeline route would traverse deep soils with loam and gravelly sandy loam textures and nearly level to rolling slopes. The remaining soils occur in narrow bands of rough broken land adjoining natural drainage channels.

Erosion susceptibility with vegetation removed would be in the range of 2.00 tons per acre per year soil loss and 0.11 tons per acre per year after complete revegetation occurs.

Low impacts from soil compaction during construction would be experienced by the sandy, gravelly soils. An estimated 3 percent of the productive capacity of the topsoil within the right-of-way would be lost for 2 to 3 years.

Topsoil segregation or double trenching techniques would minimize profile mixing and topsoil dilution. Long term loss of fertility would be less than 5 percent.

## Aquatic Resources

### Physical Components

Fourteen rivers and creeks would be crossed by the proposed alignment of the Freshwater Bay alternative. The Elwha River and Morse and Siebert Creeks are the largest streams that would be crossed between the proposed tank farm site and the prime pipeline alignment south of Green Point. Seasonal variation of stream discharge generally occurs, with high flow periods in late summer and again in late winter. Flow is generally unregulated with the exception of the Elwha River which has several dams upstream of the proposed crossing. Water quality of all streams along the proposed alignment is Class A (excellent) or Class AA (extraordinary) by Washington State Water Quality Standards (WAC 173-201).

Several impacts to surface and ground water would result from construction and operation of the pipeline and onshore storage facility. Short-term increases in turbidity would occur at and downstream of the river crossings during pipeline construction. Ground water in some of the valley areas along the alignment is encountered within 5 feet of the land surface. In these regions dewatering of the trench during construction would impact the water table level and ground water movement. Short-term sediment impact to shallow ground water regions could be anticipated from percolation of sediment laden waters. Hydrostatic test water would be withdrawn from one or several streams along the proposed route for testing of the storage tanks and pipeline. A decrease of stream discharge would occur during the withdrawal period.

No major impact would result from normal operation, however, in the event of a pipe rupture, oil could enter surface and ground water. Most stream crossings would be within 3 miles of the Strait so spilled oil would probably enter the marine environment before containment. Water quality degradation would occur for perhaps 1 year following the spill. Refer to chapter 3, for a more detailed discussion of impacts.

### Biological Components

The pipeline route between Freshwater Bay and the proposed route near Green Point would cross eight streams which support salmon and searun trout populations. Resident trout also occur in these streams. The most important streams are the Elwha River and Morse Creek. Significant spawning habitat for salmon and trout occur in the Elwha River in the vicinity of the crossing area.

Reductions to salmon and trout populations would occur as a result of spawning gravel sedimentation. Sediment would come from instream trenching activities during construction and from streambank erosion during project operation. Most of the sediment from instream trenching would be washed out of the spawning gravel during the first period of high flow, but sediment arising from streambank erosion would continue for several years until complete revegetation occurs. The greatest reductions to salmon and trout populations would occur during construction and for the first few years of project operation. Several spawning cycles would be required for these populations to recover to preproject levels. Reduced trout populations should recover in several years while salmon might take 20 years to fully recover. The initial population reductions during construction would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries if large numbers of one year-classes were eliminated. In subsequent years during project operation, population reductions would probably be within the normal range of population fluctuations and would not be noticed.

Reductions to fish populations would occur if an oil spill occurred during project operation. Trout and salmon populations would be reduced for several miles downstream from the spill site. Several spawning cycles would be required for reduced populations to recover to prespill levels; several years for trout and up to 20 years for salmon. Population reductions would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries, particularly following a large spill.

## Marine Resources

### Physical Components

A description of the physical oceanographic conditions in the vicinity of Freshwater Bay may be found in chapter 2.

Estimated frequencies for various existing, incremental, and combined oil spill risks, and explosion and fire risks are given in table 9.4-7. The at berth risk for a single point mooring at Freshwater Bay is about one spill every 0.28 years for the initial throughput and one spill about every 0.21 years for ultimate throughout.

Oil spill trajectories for hypothetical oil spills in March and September at the Freshwater Bay are shown in Map Addendum. The March simulations included a 10 cm/sec estuarine flow and the September trajectories were calculated with a 30 cm/sec estuarine flow in the model. Oil spills during March or September oceanographic and meteorological conditions would initially impact a region between Tongue Point and Ediz Hook. This would involve about 11 nautical miles of shoreline (Stewart 1978).

Expressions of probability are useful indicators of future events, but caution must be taken to avoid misinterpretation of these estimated values. "One spill every 'X' years" expresses a calculated rate and does not indicate when the spill may occur. Also, the estimate will remain valid only if conditions do not deviate significantly from historical patterns.

## TABLE 9.4-7 ESTIMATED FREQUENCIES OF VARIOUS RISKS FOR OIL TRANSSHIPMENT FROM FRESHWATER BAY TO GREEN POINT

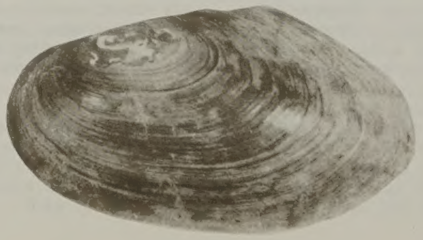
| Risk Involved | Estimated Existing Risks 1/ | Estimated Incremental Risks | | Estimated Combined Risks | | Estimated Incremental Risk for Onshore Pipeline | |
|---|---|---|---|---|---|---|---|
| | One Casualty Every: | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day |
| Oil Spill: | | | | | | | |
| In-Transit (≥2.4 bbls) | 1.2 years (0.7-4.1) | 4.6 years (2.7-16) | 3.5 years (2.1-12) | 0.95 years (0.56-3.31) | 0.90 years (0.52-3.09) | | |
| At Single Point Mooring (≥2.4 bbls) | | 0.28 years | 0.21 years | | | | |
| Bunker Barge (≥2.4 bbls) | 0.27 years (0.17-0.58) | 1.56 years (1.00-3.40) | 1.18 years (0.76-2.58) | | | | |
| Tank Farm 2/ (≥2.4 bbls) | 0.19 years (0.16-0.24) | 0.96 years (0.78-1.3) | 0.59 years (0.48-0.76) | | | | |
| Pipeline 3/ (≥2.4 bbls) | 1.19 years | | | | | 2.3 years (1.1-XX) | |
| Explosion: | | | | | | | |
| In-Transit | ~31 years | ~120 years | ~93 years | ~25 years | ~23 years | | |
| Harbor Area | ~37 years | ~63 years | ~49 years | ~24 years | ~21 years | | |
| Fire: | | | | | | | |
| In-Transit | ~35 years | ~140 years | ~105 years | ~28 years | ~26 years | | |
| Harbor Area | ~15 years | | | | | | |
| Fire and Explosion | | | | | | | |
| Tank Farm (≥$1,000) | | ~64 years (42-133) | | | | | |
| Pipeline Station (≥$1,000) | | ~66 years (50-99) | | | | | |

Source: OIW 1978a,b,c, 1979a

1/ The ranges shown in parenthesis for each throughput are estimates of the 95 percent confidence limits.

2/ The estimated existing risk range shown in parenthesis is an estimate of the 97 percent confidence limit.

3/ The upper confidence limits are unpredictable and are indicated by "XX".



## Biological Components

Habitats in Freshwater Bay consist of sandy beaches and sand and rocks offshore. Eelgrass beds extend from Observatory Point on the west to about Coville Creek. Resources consist of intertidal clams, crabs, sport salmon fishing, and commercial otter trawling within the bay and salmon purse seine fishing off Angeles Point. The western part, particularly inside the eelgrass beds, is a major waterfowl area. The location of these resources within Freshwater Bay and in the adjacent Strait of Juan de Fuca are found in Map Addendum.

No significant impacts to the marine environment should occur as a result of construction of single point moorings off Freshwater Bay.

Operational impacts resulting from in-transit or from at-berth single point mooring ruptures of transfer hoses, and of exposed submarine pipelines, and chronic oil spills would degrade the water quality in Freshwater Bay and in the Strait and affect marine resources within the area.

Resources impacted would be intertidal clams and fishes of commercial and sport value in and adjacent to the bay, and the otter habitat and Pacific halibut spawning grounds in Crescent Bay. Waterfowl mortality would also be expected in Freshwater Bay. Specific details on oil spill impacts can be found in chapter 3.

No marine resource impact would occur in removing the single point moorings at Freshwater Bay.

### Terrestrial Vegetation

In considering potential impacts resulting from storage facility and pipeline construction and operation, it was assumed that 140 acres of forest land on the storage area would be cleared, that 9 miles of the 17-mile pipeline corridor is forested and that Bonneville Power Administration right-of-way is paralleled along the entire alternate pipeline route.

The pipeline and storage facility area is within the cedar-hemlock-Douglas-fir forest ecoregion. Western red cedar, western hemlock, Douglas-fir, and red alder are dominant components of these forest lands. About 204 acres of dominant forest vegetation, assumed to average 1,400 board feet per acre, would be lost from timber production for at least 25 years. This would be the most substantial impact on vegetation resulting from implementation of this alternative.

No endangered or threatened plant species are known to occur within the storage area or pipeline corridor.

### Terrestrial Wildlife

Assuming the wildlife habitat is similar to the Low Point and Green Point alternatives, the area may have high potential for bald eagle and peregrine falcon habitat. No nests are known and sightings are not confirmed. Construction of the pipeline would change 200 acres of forest wildlife habitat to open type.

### Cultural Resources

The proposed port alternative at Freshwater Bay and the pipeline segment connecting the port site with the primary pipeline route would not affect any currently known cultural resource sites. There is high potential for discovery of sites, especially along the shoreline near the mouth of the Elwha River where pipelines from the monobouys would come on land. Impacts on any sites would be the same as those discussed in chapter 3.

### Visual Resources

Freshwater Bay would have two single point moorings (SPM) located 4/5 of a mile, to a little over a mile from shore.

Each SPM would have a submarine line to an onshore tank farm. As this confluence of two submarine pipelines emerged from the water and ascended to the tank farm 125 feet above, a wedge-shaped notch, similar to that at Green Point would be excavated. This would be visually offensive to viewers from boats in the Strait.

The tank farm would require the clearing of 140 acres of forestland and could have high visual impact when viewed from the Strait and/or from local residences.

A few miles of new pipeline right-of-way is anticipated, from the tank farm south, where it turns east and would parallel and possibly partially superimpose the BPA corridor for about 17 miles where it ties into the prime route from Green Point south.

Construction impacts may be high, especially through populated areas, persisting as a low for the life of the project. Moderate impact could be caused by the crossings at State Highway 112 and U.S. 101.

### Land Use

Existing land uses near the onshore storage facility and along the proposed pipeline route consist primarily of forest land with interspersed pasture land and rural residential use. In terms of land use, most of the impact would be to forest lands as previously described (see Terrestrial Vegetation).

The onshore storage facility would be located in an area of Clallam County that is not zoned. Planned land use for the onshore storage site and pipeline route west of Port Angeles is designated "potential living area." A new preliminary land use plan that has not yet been adopted designates these areas for residential use. About 1 mile of the pipeline route has been zoned by the city of Port Angeles for residential and public use. East of Port Angeles the pipeline route traverses areas zoned by Clallam County for forest and agricultural uses. Although the onshore storage site does not conflict with zoning (in its absence), it does conflict with the planned residential use. The project might not be consistent with the Clallam County Shoreline Master Program.

Areas with special management concerns that would be affected include the Lower Elwha Indian Reservation located on Angeles Point, 2 to 3 miles east of the SPM sites and the onshore storage facility. The pipeline route would traverse 1/4 mile of Olympic National Park, requiring disturbance of about 3 acres of forest land within the park.

### Transportation and Utility Networks

The Freshwater Bay SPM site would be located adjacent to the precautionary area at buoy "JA," with the SPM buoys situated obliquely to the Strait rather than parallel. It might therefore present some inconvenience and hazard to smaller tugs and their tows operating close to the shoreline. The inbound traffic lane would be about 7,000 feet from the closest mooring, and the channel widening at Freshwater Bay would appear to provide sufficient room for queuing tankers to prevent any significant hazard to larger vessels using the traffic lanes.

State Highway 112, a 2-lane highway, provides access to the Freshwater Bay area. Construction traffic would significantly lower service levels on State Highway 112 from Port Angeles west to Freshwater Bay during the first year of construction.

Electric power requirements for this alternative would be similar to those of the proposed action and would cause essentially the same impacts as the proposed action.

### Recreation

No significant impacts to known recreational activities are anticipated as a result of normal construction, operation, or abandonment activities associated with the SPM, onshore facilities, or connecting pipeline system. The crossing area of the Elwha River is managed for scenic and recreational values according to the Shoreline Management Act of 1971.

Oil spills at sea would impact local offshore bottom and salmon fishing areas, steelhead fishing on the Elwha River, as well as several public beaches, parks, and shellfish collecting areas. See Map Addendum for locations of marine recreation areas.

Preliminary oil-spill risk analysis indicates that if a tanker collision occurred off the SPM in March, oil would impact sport salmon fishing in the Crescent and Freshwater Bay areas, and from Port Angeles to the Dungeness Spit area. Shellfish collection in Crescent and Freshwater Bays as well as the Dungeness Spit area could be lost. Loss of the shellfish beds, which could take 4 to 10 years to return to productivity, would diminish recreational attractiveness of the Dungeness Spit. Loss of use of, and impacts relating to oil fouling of, parks and marinas between the Crescent Bay and the Dungeness Spit areas would severely impact marine recreationists for the season. Impacts to the Port Angeles areas are discussed in chapter 3. Impacts from a tanker incident off the SPM occurring in September would be less severe. Impacts to recreation would be experienced from roughly Pillar Point to Freshwater Bay.

In general, impacts would be less along this route alternate as compared to the proposed route as a result of avoiding the Port Angeles metropolitan area and harbor.

### Social and Economic Conditions

This section considers both the Freshwater Bay alternative and the pipeline section which extends from Green Point to the Clallam County border, since the impacts from both would affect the county simultaneously.

The Freshwater Bay alternative and the pipeline would bring a peak population increase of 1,160 during construction and 202 during operation. The increase during construction represents a 2.6 percent increase over the projected 1980 population for Clallam County. Most of the population would reside in Clallam County. The additional 17 miles of pipeline would require a larger construction force than for the NTPC proposed route.

Assessed valuation of the alternative would be $89,300,000 and with the additional 17 miles of pipeline west of Green Point it would be $97,200,000. Property taxes would amount to $1,385,000 for the Freshwater Bay alternative, and $1,505,000 with the additional pipeline.

Impacts on community services would be similar to those created by the proposal submitted by NTPC. A detailed discussion is found in chapter 3 of this report. During construction housing would be insufficient to accommodate the population increase, schools would be slightly strained, and increased demands would be placed on police and fire personnel. The fire district which serves the Freshwater Bay area is rated 9 on Washington's 10-point insurance rating system, and would not be equipped to handle project-related emergencies during construction and operation.

Changes in the quality of life in Port Angeles would be less significant than with the proposed port at Port Angeles, except in the event of a major oil spill.

The Lower Elwha Indian Reservation would be substantially impacted by this alternative. The Indians rely heavily on Freshwater Bay for fishing which supports their economy and preserves their traditional way of life. Construction activity, tanker traffic, and possible oil spills would significantly disrupt these activities.

## LOW POINT

### Description

From a survey of six port sites located west of Port Angeles, NTPC selected Low Point as their primary alternative in the siting application to Washington Energy Facility Site Evaluation Council, 1978. The tanker unloading facilities would be two SPM's located north of Low Point in a 210 foot (35 fathoms) water depth in the Strait of Juan de Fuca. The tanker swinging radii toward shore would be about 4000 feet which would be at a 90 foot (15 fathoms) water depth. Two submarine pipelines, approximately 2.6 miles in length, would be constructed from the SPMs to the shoreline and then up to the onshore storage facilities located on about 294 acres (figure 9.4-7).

The pipeline system from the Low Point alternative site to the proposed pipeline near Green Point would require one additional pump station and about 28 miles of additional pipeline. This route would cross agricultural and forest lands and would parallel about 10 miles of power transmission right-of-way to the connection with the proposed NTPC pipeline corridor from Green Point.

### Climate and Air Quality

No impacts on climate are anticipated for this alternative port site.

Low Point is located in rural surroundings and there are no large pollution sources in the immediate area. Some significant industrial pollution sources are found in Port Angeles, about 20 miles east of Low Point. There are no air quality data available for Low Point. However, background concentrations are expected to be low, as there is little influence from the Port Angeles pollution sources.

A limited modeling study was performed by Science Applications, Inc. (SAI 1978). However, in the absence of meteorological data at Low Point, meteorological data for Port Angeles had to be used. Since these data may not necessarily be representative for the site, the modeling results would have to be interpreted with caution. This analysis assumes that the tankers would burn fuel with a sulfur content of 0.45 percent or less while operating in port, as proposed by the applicant.

Calculated maximum 1-hour, 3-hour, and 24-hour average sulfur dioxide concentrations are well within the federal and state air quality standards. The highest annual average sulfur dioxide concentration for a 933,000 bpd throughput is 2.3 ug/m$^3$, which is 11 percent of the maximum allowable Class II increment. The highest concentration would occur about a mile east of the proposed SPM site. The modeling analysis indicated, however, potential violations of the Class I standards for sulfur dioxide in the Olympic National Park. A more comprehensive study would have to be made after collecting some on-site data, to determine whether the Class I standards would be met.

The maximum 24-hour average particulate concentration from this alternative proposal would be 0.8 ug/m$^3$ which is well within the Class II increment of 37 ug/m$^3$. The annual average particulate concentration would be negligible.

The highest annual average concentration of nitrogen oxides would be 1.2 ug/m$^3$ which is 12 percent of the Federal standard.

No ozone modeling was performed for this alternative port site. However, impacts would be about the same as for the Port Angeles site. Little change in ozone concentrations would occur in the vicinity of the SPM. Ozone concentrations downwind of the onshore storage facilities might be increased by about 10 to 20 percent above background levels when conditions were favorable for ozone formation. However, it is not likely that the project would cause any violation of the Federal ozone standards.

### Noise

During the construction of the onshore storage facilities, noise levels up to 70 dBA would occur in areas adjacent to the construction site. Noise levels could adversely affect recreational activities at the nearby Lyre River Campground.

Construction of the pipeline would cause noise levels of up to 65 dBA at a distance within 1,000 feet of the alignment and up to 50 dBA at distances of about 4,000 feet.

These noise levels would be mostly confined to daytime hours, and would be sustained for 5 days or less.

During the operation phase the primary noise source would be the electric onshore storage facilities pumps. Noise would generally be audible at distances of less than 3,000 feet. The relatively dense vegetation that exists in the area would reduce some of the noise levels.

## Topography and Geology

This alternate port site is characterized by gently sloping terrain (5° to 7° to the north), terminating in a relatively steep coastal bluff 100- to 150-feet high. The 28-mile pipeline route segment is characterized by relatively gentle terrain, intersected by the Elwha River and numerous small streams. Seventeen miles of this route, from Freshwater Bay to Green Point cover essentially the same terrain as the Freshwater Bay alternative. While construction for this port alternative would result in fewer acres disturbed than at the proposed port site (140 acres as opposed to 242), the need for 28 miles of additional pipeline and additional 336 acres (12 acres per mile) disturbed would result in a greater topographic impact for this alternative than for the proposed port.

Surficial geologic materials found at Low Point and along the 28-mile route to Green Point are similar to those found at the proposed port site consisting primarily of Quaternary glacial debris. Consequently, impacts to the gologic materials would be similar, consisting of the excavation of large volumes of geologic material and some excavation-induced changes in the physical characteristics of the material (porosity, permeability, erosion potential, etc.). As the anticipated volume of material that would be excavated at Low Point is unknown, a quantifiable comparison with Green Point as to the magnitude of impacts cannot be made at present.

### Geologic Hazards

Low Point and the pipeline route to Port Angeles (Low Point pipeline mile 20) is located in an area of moderate to low seismic activity corresponding to a Seismic Risk Zone 2 (moderate earthquake damage expected); the remainder of the route to Green Point, is located near the western margin of a moderately active seismic area corresponding to a Seismic Risk Zone 3 (maximum earthquake damage expected). Like the Freshwater Bay route alternative, this route would come within 10 miles of the possibly active Calawah Fault; however, there is no evidence of apparent recent fault movement. In like measure, seismic activity is lower at this port alternative than at the proposed port site. Although seismic activity could result in landslides along the potentially unstable coastal bluffs, the overall anticipated seismic impacts should be lower than at the proposed port site.

Although no evidence of significant landsliding is apparent at Low Point, there is some evidence of slope instability west of the port site (NTPC 1978). Consequently, there is a potential for landsliding in the area; there is no evidence of slope instability along the pipeline route. As little detailed study has been conducted at Low Point, it is not presently possible to compare slope instability impacts at Low Point with Green Point.

A potential for outburst flooding occurs at the Elwha River (Low Point pipeline mile 18), where some damage could occur to the pipeline. As no potential exits at the proposed site for significant outburst flooding, the anticipated impacts would be greater along this alternate route segment.

### Mineral Resources

No significant difference in impacts has been identified.

## Soils

The dominant soil at this alternative proposed onshore storage facility is Agnew silty clay loam. This is a deep, somewhat poorly drained glacial till soil with nearly level surface. Perched water tables are common. Impacts from erosion during construction would be low because of the low surface gradients and erosion control measures such as settling ponds, diversionary channels, and protective mulch. Normal annual soil loss would be approximately 0.01 tons per acre as compared to 0.66 tons per acre during construction. Revegetation after construction would reduce losses to about 0.06 tons per acre.

The silty clay loam surface soils would be highly susceptible to compaction by construction traffic and would lose an estimated 10 percent of productive potential for a period of about 2 years. Adverse impacts from profile mixing would be low because of topsoil segregation and minimal need for cut and fill operations.

Soils of the proposed route consist of about 58 percent Elwha loams, 24 percent Clallam loams, 7 percent Everett gravelly and sandy loams, 7 percent rough broken lands, and 4 percent miscellaneous soils. Slopes would vary from nearby level to rolling. These are deep gravelly soils on glacial uplands.

Erosion susceptibility would be approximately 0.20 tons per acre per year loss after complete revegetation.

Adverse impacts from soil compaction during construction would be low. The gravelly loam soils would lose an estimated 5 percent of productivity and would return to normal in 2 to 3 years. Profile mixing and topsoil dilution would be minimal providing topsoil segregation procedures are followed.

## Aquatic Resources

### Physical Components

Twenty-four rivers and creeks would be crossed by the proposed alignment of the Low Point alternative. The Lyre and Elwha Rivers, and Morse and Siebert Creeks are the largest streams that would be crossed by the proposed pipeline between the proposed tank farm site and the junction with the NTPC proposed pipeline south of Green Point. Seasonal variation of stream discharge generally occurs, with high flow periods in late fall or early winter, and low flow periods in late summer and again in late winter. Flow is unregulated with the exception of the Elwha River which has several dams upstream of the proposed alignment. Water quality of these streams is Class A (excellent) or Class AA (extraordinary) by Washington State Water Quality Standards (WAC 173-201).

Several impacts to surface and ground water would result from construction and operation of the pipeline and onshore storage facility. Short-term increases of sediment load would be anticipated at and downstream of the river crossings during pipeline construction. Increased turbidity and siltation on the Lyre River could result from construction of the onshore storage facility. Ground water in some of the valley areas along the alignment would be encountered within 5 feet of the land surface. In these regions dewatering of the trench during construction would impact the water table level and ground water movement. Short-term sediment impact to shallow ground water regions could be anticipated from percolation of sediment laden waters. Hydrostatic test water would be withdrawn from one or several streams along the proposed route for testing of the storage tanks and pipeline. A decrease of stream discharge would occur during the withdrawal period. No major impact would result from normal operation, However, in the event of a pipe rupture oil could enter surface water and groundwater. Most stream crossings would be within 3 miles of the Strait of Juan de Fuca, so spilled oil would probably enter the marine environment as well. Water quality degradation would occur for at least 1 year following the spill. Refer to chapter 3 for a more detailed discussson of impacts.

### Biological Components

The pipeline route between Low Point and the proposed route near Green Point would cross 16 streams which support salmon and searun trout populations. Resident trout also occur in these streams. The most important streams are the Lyre and Elwha Rivers, and Suzie, Nelson, Salt, and Morse Creeks.

Significant spawning habitat for salmon and trout occurs on the Elwha River downstream from the crossing area.

Reductions to salmon and trout populations would occur as a result of spawning gravel sedimentation. Sediment would come from instream trenching activities during construction and from streambank erosion during project operation. Most of the sediment from instream trenching would be washed out of the spawning gravel during the first period of high flow, but sediment arising from streambank erosion would continue for several years until complete revegetation occurs. The greatest reductions to salmon and trout populations would occur during construction and for the first few years of project operation. Several spawning cycles would be required for these populations to recover to preproject levels.

Reduced trout population should recover in several years while salmon may take 20 years to fully recover. The initial population reduction during construction would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries if large numbers of 1 year-class are eliminated. In subsequent years during project operation, population reductions would probably be within the normal range of population fluctuations and consequently would not be noticed.

Reductions to fish populations would occur if an oil spill occurs during project operation. Trout and salmon populations would be reduced for several miles downstream from the spill site. Several spawning cycles would be required for reduced populations to recover to prespill levels; several years for trout and up to 20 years for salmon. Population reductions would probably not be noticed in the ocean sport, commercial, or Indian fisheries, but might be noticed in the river fisheries, particularly following a large spill. The chance of an oil spill occurring at a stream crossing would be the same as with the proposed route.

See chapter 3 for a more detailed analysis of impacts.

## Marine Resources

### Physical Components

Physical oceanographic conditions at Low Point and in the adjacent Strait of Juan de Fuca are described in chapter 2.

Estimated existing, incremental, and combined frequencies for various oil spill risks and explosion and fire risks are presented in table 9.4-8. The estimated risks for the single point moorings are one spill about every 0.28 years for 709,000 barrels per day throughput and one spill about every 0.21 years for 933,000 barrels per day throughput. The estimated pipeline spill risk, for about 106 onshore miles and about 20 offshore miles of pipeline to Green Point, is one spill every 4.0 years for both throughputs. Detailed discussion of risk analyses can be found in chapter 3.

Oil spill trajectories off Low Point were computer simulated in March and September. Estuarine flows of 10 cm/sec for March and 30 cm/sec for September were included in the computer model. These trajectories are shown in the Map Addendum. For March oil spills the most likely initial impact zone would be between Deep Creek and Crescent Rock. But, due to a frequently observed cross channel current, it was also inferred that Parsons Point to Cape Calver and the Sooke Basin, Canada, could also be initial impact zones for a spill off Low Point. Oil spills during September could initially impact the coastline somewhere between Pillar Point and Crescent Rock.
Because of channel cross currents, Parsons Point to Cape Calver and the Sooke Basin could also be initial impact zones. The most likely initial impact zones and shoreline miles in each zone are given in table 9.4-9.

Expressions of probability are useful indicators of future events, but caution must be taken to avoid misinterpretation of these estimated values. "One spill every 'X' years expresses a calculated rate and does not indicate when the spill may occur. Also, the estimate will remain valid only if conditions do not deviate significantly from historical patterns.

TABLE 9.4-8 ESTIMATED FREQUENCIES OF VARIOUS RISKS FOR OIL TRANSSHIPMENT FROM LOWPOINT TO GREEN POINT

| Risk Involved | Estimated Existing Risks 1/ | Estimated Incremental Risks | | Estimated Combined Risks | |
|---|---|---|---|---|---|
| | One Casualty Every: | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day | 709,000 bbls/day One Casualty Every: | 933,000 bbls/day |
| Oil Spill: | | | | | |
| In-Transit (≥2.4 bbls) | 1.2 years (0.7-4.1) | 5.6 years (3.3-19) | 4.3 years (2.5-15) | 0.99 years (0.58-3.42) | 0.94 years (0.55-3.26) |
| At Single Point Mooring (≥3.6 bbls) | | 0.28 years | 0.21 years | | |
| Bunker Barge (≥2.4 bbls) | 0.27 years (0.17-0.58) | 1.56 years (1.00-3.40) | 1.18 years (0.76-2.58) | | |
| Tank Farm 2/ (≥2.4 bbls) | 0.19 years (0.16-0.24) | 0.96 years (0.78-1.3) | 0.59 years (0.48-0.76) | | |
| Pipeline 3/ (≥2.4 bbls) | 1.19 years (0.57-XX) | 4.0 years (1.9-XX) | | | |
| Explosion: | | | | | |
| In-Transit | ~31 years | ~150 years | ~110 years | ~29 years | ~24 years |
| Harbor Area | ~37 years | ~63 years | ~49 years | ~24 years | ~21 years |
| Fire: | | | | | |
| In-Transit | ~35 years | ~170 years | ~130 years | ~29 years | ~27 years |
| Harbor Area | ~15 years | | | | |
| Fire and Explosion | | | | | |
| Tank Farm (≥$1,000) | | ~64 years (42-133) | | | |
| Pipeline Station (≥$1,000) | | ~66 years (50-99) | | | |

Source: OIW 1978a,b,c, 1979a

1/ The ranges shown in parenthesis for each throughput are estimates of the 95 percent confidence limits.

2/ The estimated existing risk range shown in parenthesis is an estimate of the 97 percent confidence limit.

3/ The upper confidence limits are unpredictable and are indicated by "xx."

TABLE 9.4-9 MOST LIKELY REGION OF FIRST OIL IMPACT FROM AN OIL SPILL AT LOW POINT

| March Conditions | Approximate Nautical Miles of Shoreline | September Conditions | Approximate Nautical Miles of Shoreline |
|---|---|---|---|
| Deep Creek to Crescent Rock, U.S. | 11 | Pillar Point to Crescent Rock, U.S. | 10 |
| Parsons Point to Cape Calver, Canada | 11 | Parsons Point to Cape Calver, Canada | 11 |
| Sooke Basin, Canada | 13 | Sooke Basin, Canada | 13 |

Source: Stewart 1978; Oceanographic Institute of Washington 1978d

## Biological Components

The marine habitats at and offshore of Low Point are sandy beach and rocky, mixed subtidal strata. Marine resources in the area are crabs, commercial gill net, purse seine and otter trawl fisheries, and sports fisheries. General distribution of these resources are shown in the Map Addendum.

Halibut spawning grounds are off Crescent Bay, Port Angeles, Green Point, and Dungeness spit. Harbor seals haul out at Low Point and in Dungeness Bay, and river otter are found in Crescent Bay. Waterfowl nesting and/or roosting areas are concentrated off Green Point, on Dungeness Spit, and southeast of Dungeness Bay to Sequim Bay.

No construction impacts are anticipated during placement of the single point moorings and associated submarine pipelines at Low Point.

During the operation phase small but frequent oil spills from in-transit casualties from tankers at-berth at the single point moorings, and from transfer hoses and submarine pipeline ruptures would degrade the water quality at Low Point and in the strait.

Extensive water quality degradation in the Strait of Juan de Fuca could occur as a result of a large in-transit or at-berth oil spill at Low Point. A large spill would affect Canadian and United States commercial and sports fisheries and the shrimp, crab, clam, and oyster industries. High mortality of diving birds southeast of Dungeness Spit and off Green Point could occur. The harbor seal hauling out area at Low Point and the river otter habitat in Crescent Bay could be severely oiled. Heavy mortality to herring roe could occur and the loss of one year class of herring could have an indirect impact upon salmon, who would have normally fed upon that year class.

### Terrestrial Vegetation

The onshore storage facility and the associated pipeline segment for this port alternative are within the cedar-hemlock-Douglas-fir forest ecoregion. Species for this region, which are dominant at Low Point, include Douglas-fir, western hemlock, and western red cedar, red alder, and Sitka spruce are also important tree components at Low Point.

Construction of the storage facility would require clearing of 140 acres dominated by Douglas-fir, western red cedar and red alder (Energy Facility Site Evaluation Council application by Northern Tier Pipeline Company 1978). Timber volume that would be lost is estimated to be about 10 thousand board feet per acre. This area would not be available for timber production for at least 25 years.

Approximately 22 miles of the 28-mile pipeline corridor is forest land dominated by western red cedar, Douglas-fir, and red alder. The most substantial vegetation impact would result from clearing of this approximately 230 acres of forest. This forest land supports about 14 thousand board feet per acre of timber. Timber production would be lost on most of this acreage for at least 25 years.

No threatened or endangered plant species are known to occur within the storage facility area or the pipeline corridor.

### Terrestrial Wildlife

Impacts to wildlife would include modification of 140 acres of habitat, short- and long-term displacement of animals, death of nonmobile species, increased stress, and changes in species composition.

An active bald eagle nest is within 5 miles of the proposed onshore facilities. Bald eagles scavenge marine habitats including sandy and rock beaches and may hunt along the Low Point shoreline. Long-term effects from the loss of an occasional feeding ground and increased disturbance could be the disruption of a breeding season in a species with naturally low reproductive rate. Bald eagles breed only in years when food and other conditions are optimal.

The occurrence of peregrine falcons in the region has been documented (Funkhouser 1978), but their presence on the site would probably be limited to occasional use of trees near the bluffs as hunting perches.

The Peale's peregrine falcon may occasionally use the this alternative onshore storage facilities site. This raptor prefers open country including beaches, sand spits (such as Dungeness Spit), and marshes (Eaton 1975).

The bald eagle, peregrine falcon, and other wildlife requiring undisturbed habitat, could suffer short-term effects during construction of onshore storage facilities.

The pipeline would cross 22 miles of coniferous forest and eliminate 230 acres of forest habitat. The change in habitat would adversely affect some species while benefiting others.

Ruffed grouse are present in relatively high numbers on the site and may average 2.3 birds per square mile in spring. Their preferred habitat is abundant in the area. Long-term impact would include reduction and permanent alteration of shrub habitat at the storage facility site, whereas, short-term shrub disturbance would probably occur from corridor maintenance.

Oil spills could result in toxic effects to wildlife and destruction of habitat.

### Cultural Resources

The port at Low Point and the pipeline segment connecting the port and onshore storage facility site to the proposed pipeline route would potentially affect the cultural resource sites listed below. There is high potential for discovery of additional archaeological and historical sites along the shoreline of the Strait of Juan de Fuca and at the crossings of the Elwha River and several smaller stream valleys. The currently known sites, all in Clallam County, are:

TABLE 9.4-10 CULTURAL RESOURCE SITE, LOW POINT ALTERNATIVE

| Site Name | Site Type | Location |
|---|---|---|
| 45CA 10 | Campsite and shell midden | Onshore storate site |
| 45CA 11 | Campsite and shell midden | Onshore storage site |
| Ocean View Cemetery | Historic | In Port Angeles |
| Lincoln Park | Historic | In Port Angeles |
| Beaumont Cabin | Historic | In Port Angeles |
| Clallam County Courthouse | Historic | In Port Angeles |
| Congregational Church | Historic | In Port Angeles |
| Masonic Temple | Historic | In Port Angeles |
| Olympic Hotel | Historic | In Port Angeles |
| St. Andrews Episcopal Church | Historic | In Port Angeles |
| Mt. Angeles Cemetery | Historic | In Port Anglees |

Potential impacts to these sites would be the same as those discussed in chapter 3.

### Visual Resources

Low Point would have two single point moorings located about 10,000 feet from shore. Each single point mooring would have a submarine line, that would emerge from the water at the shoreline and traverse the 50-foot bluff as it ascended to the tank farm. The tank farm would be located southwest of the Low Point single point moorings and would require the clearing of approximately 150 acres of forest land on a 5 to 7 percent slope. This slope could necessitate a multilevel tank farm site design and create an adverse visual impact when observed from the strait, shoreline, or when visiting the site. The notch cut for the pipeline through the bluff should have an impact similar to the proposed cut at Green Point. See section 3.1.11 for impacts.

Construction of the pipeline in a southerly direction, where it would join and parallel the Bonneville Power Administration existing corridor in an easterly direction, would require the clearing of a 90-foot right-of-way through mixed forest land.

Impacts through this section should be moderate to high, for the life of the project.

### Land Use

Existing land uses near the onshore storage facility and along the proposed pipeline route consist primarily of forest land with interspersed pastureland and rural residential use. Construction activity for both the storage facility and the pipeline would directly impact approximately 350 additional acres within Clallam County with 260 acres occupied by permanent pipeline right-of-way and the additional pump station.

The onshore storage facility would be located in an area that is unzoned. The Clallam County Comprehensive Plan designates the area as potential living area, and the preliminary plan (not yet adopted) designates the area for residential use. The pipeline route traverses areas zoned for forest and agricultural use by Clallam County, and about 1 mile passes through areas zoned by Port Angeles for residential and public uses. As at Green Point construction of the submarine pipeline to the onshore storage site might not be consistent with the Clallam County Shoreline Master Program. In terms of the amount of land converted to project use the impact of the Low Point alternative would not be significant.

### Transportation and Utility Networks

The Low Point single point moorage would be located between the inbound Vessel Traffic System traffic lane and the Clallam County shoreline. Once in operation, tanker's queuing near the SPM might cause a significant hazard to other inbound vessel traffic.

State Highway 112, a two-lane paved roadway provides access to the Low Point area from Port Angeles. Construction traffic would significantly lower service levels west of Port Angeles to the Low Point area, particularly during the summer when tourist traffic would coincide with construction traffic for both the onshore storage facility and the pipeline in this area.

The onshore storage facility and the additional pump station would be located within the Clallam County Public Utility Department service area. Service to these facilities would require approximately 25 megawatts additional power which might further aggravate possible regional power shortages.

### Recreation

No significant impacts to recreational activities are anticipated as a result of normal activities associated with the construction, operation, or abandonment phases of the SPM facilities, storage facilities or connecting pipeline system. Noise and activities associated with construction or abandonment of the SPM and onshore storage facilities could be offensive to campers using the nearby Lyre River State Park. The Elwha River is identified for statewide significance with scenic and recreational values.

Oil spills in the Strait of Juan de Fuca would impact an indeterminate number of recreationists using nearby beaches, tidelands, boat moorages, shellfish, and offshore fishing resources. For locations of these recreational activities, see Map Addendum.

Preliminary oil spill risk analysis indicates that a tanker oil spill incident off the SPM would affect marine recreation from Cape Flattery to Angeles Point. There could be losses to sport salmon fishing from Port Angeles to the Spit. Recreational shellfishing areas east of Pillar Point could be contaminated for 4 to 10 years. Oil fouling of public beaches, tidelands, boat moorages, and recreational boats at sea and in harbor would occur and affect recreationists for the short term.

### Social and Economic Conditions

The Low Point alternative and the pipeline would bring a peak population increase of 1,160 during construction and 202 during operation. This represents a 2.6 percent increase over the projected 1980 population for Clallam County. Most of the population would reside in Clallam County. The additional 28 miles of pipeline would require a greater number of construction personnel than the proposal, but the operation force would be less.

Assessed valuation of the alternative would be $94,400,000 and with the additional 17 miles of pipeline east of Green Point it would be $102,300,000. Property taxes would amount to $1,462,000 for the Low Point alternative, and $1,585,000 with the additional 17 miles of pipeline in the county.

Impacts of the community infrastructure would be similar to those created by the NTPC proposal. A detailed discussion is found in chapter 3. During construction housing would be insufficient to accommodate the population increase. Increased demands would be placed on police and fire personnel. The fire district which serves the Low Point area is rated 9 on Washington's 10-point insurance rating system, and would not be equipped to handle project related emergencies during construction and operation.

Changes in the quality of life in Port Angeles during operation would be less significant than with the proposed port at Port Angeles. Visual impacts would be significantly lower since residents would not see the facility from town. Perceived impacts to tourism due to visual degradation would be virtually nonexistent. Perceived impacts to air and water quality in the harbor would probably be lower than with the proposal. Recreational use of Ediz Hook would remain in its present state, and could possibly be increased by a city parks development program.

## ONSHORE FACILITIES ALTERNATIVE

### Description

Information on alternate onshore storage facilities was presented in the NTPC application to the Washington Energy Facility Site Evaluation Council (EFSEC). Site selection information has been adapted in the following description.

The NTPC selection of a site for the onshore storage facilities in the vicinity of the proposed location of the tanker unloading facilities in Port Angeles Harbor was based on the following criteria.

Availability of sufficient land (200 to 300 acres) in proximity to Port Angeles Harbor. Sites farther than 7 to 10 miles from the port are not normally feasible because of limitations and difficulties associated with unloading the tankers. Tanker unloading rates must be maintained at high levels to minimize the time tankers are at berth.

Acceptability of the site for construction of storage and related facilities. Topography, soil conditions, and drainage are factors that must be considered, as well as access. In this case, the site must be located such that routing of unloading pipelines from the tanker unloading facilities to the site is feasible, as well as routing of the main pipeline away from the site. Accessibility of the site to transportation facilities (road and railroad) is a factor that is important during construction and operation.

Proximity to transmission lines. This is an important factor, as the initial pump station for the pipeline system will be located at the onshore storage facilities and will require electric power.

Acceptability of the site with regard to local zoning ordinances and land use plans.

During the late spring and summer of 1976, NTPC investigated various sites in the vicinity of Port Angeles as shown on figure 9.4-8. A cursory examination was made of sites 1 and 2, located in the area west of the Fairchild International Airport. Site 1 is owned by the Port of Port Angeles and is used for dry log storage. Site 2 is an area located near the city sanitary landfill. These two sites were eliminated from further consideration because of the difficulties that would be encountered in routing unloading pipelines from the tanker berths along Ediz Hook, through the industrial area at the base of Ediz Hook, and through the urban area to the sites. Also, locating large storage tanks in the vicinity of the Fairchild International Airport could be considered a hazard to air traffic. Possible accidents could expose the storage site to damage from fire.

After sites 1 and 2 were eliminated, further investigations were undertaken to locate other potential sites that might meet the criteria. These investigations

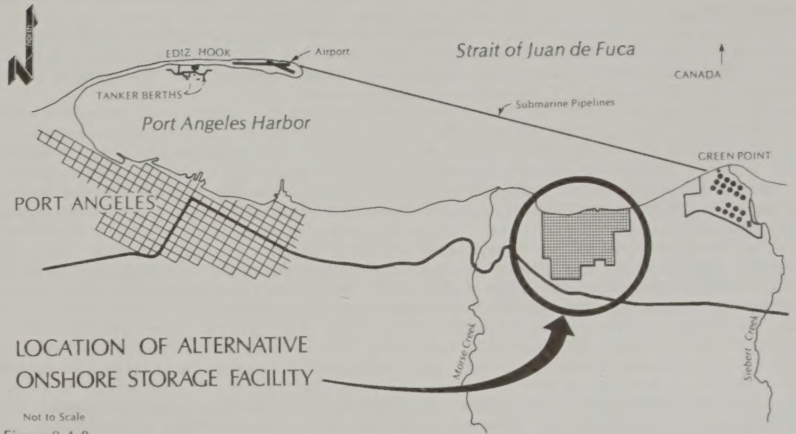


Figure 9.4-8

Ediz Hook

Bureau of Land Management

indicated that site 3, an area west of Green Point, was a suitable location for the onshore storage facilities. Title reports were obtained for all parcels of property making up site 3. Personal contacts were made with all property owners and negotiations were undertaken to obtain options for the property. After extensive negotiations, NTPC representatives were unable to obtain options for the property and efforts were initiated to find another suitable site.

The location in the vicinity of Green Point (site 4) was selected as a suitable site after efforts failed to obtain options for the property at site 3. Investigations determined that site 4 met all the criteria, although it was unclear if the onshore storage facilities were consistent with local zoning ordinances and land use plans that applied to sites 3 and 4. Title reports for the property at site 4 were obtained and negotiations were initiated with the property owners to obtain suitable options. Options for the property acquisition were obtained from July to September 1976. Therefore, site 4, Green Point, was designated the proposed site for the onshore storage facilities and site 3 the primary alternative.

Site 3, the primary alternative site for the onshore storage facilities, is located approximately 4.6 miles from the tanker unloading facilities on Ediz Hook. This site meets all the criteria for an onshore storage facilities site. The topography, soil conditions, and drainage of this approximately 545 acre site are suitable for construction of onshore tanks and other related facilities. The Chicago, Milwaukee, St. Paul, and Pacific Railroad crosses the site, providing rail access. Road access can be readily provided from a presently unimproved road that connects the southern portion of the site with U.S. Highway 101. Electric service could be provided by a transmission line located approximately 1 mile south of this alternative site.

This site (Site 3) is primarily forested, with a small agricultural/pasture area of approximately 92 acres in the northern central portion. The onshore storage facilities would be compatible with existing land uses if the facilities are sited away from a nearby residential area and if steps are taken to preserve wooded areas as a screen and buffer.

The Clallam County Comprehensive Plan indicates that the site is at the western boundary of an area designated for future "agricultural and residential" use. The area immediately to the west is designated for future "residential" use. All other bordering lands are classified "agricultural and residential". On the county's temporary interim zoning map, this site is classified as an R-2, Suburban Residential Zone. The exact meaning of this zoning is unclear.

The Clallam County Shoreline Master Program (Clallam County Shoreline Advisory Committee 1976) designates the shoreline along the Strait of Juan de Fuca as a conservancy environment in the area where the Strait constitutes the northern boundary of the alternative site. While the Economic Development Element of the program does not permit commercial and industrial developments in conservancy environments, the section that regulates "use activities" indicates that utility lines in shoreline areas are permitted if "underground so as to do minimal damage to the aesthetic qualities of the area." Furthermore "upon completion of the underground installation the shoreline must be restored to its original configuration and replanted." Construction of the submarine pipelines might not comply with regulations governing development in conservancy environments, since it is not possible to restore the shoreline bluff at Green Point to its original configuration.

Based on the above evaluations, it was concluded that it would be feasible to construct onshore storage facilities at site 3. However, as previously mentioned, options could not be obtained on the property (NTPC 1978).

The environmental impacts of site 3, the primary NTPC alternative located west of the Green Point site, would be similar to construction impacts of the proposed site at Green Point. Construction and operation impacts on the air quality, aquatic, terrestrial, and social and economic environment would be similar to the proposal due to the proximity of the alternative site to Green Point. However, the alternative could be in conflict with Clallam County land use plans and zoning. Construction of the submarine pipelines could be in conflict with the Clallam County Shoreline Master Program.

## ROUTE SEGMENT ALTERNATIVES

The route segment alternatives described in this section represent a selection of variations of The Northern Tier Pipeline Company's proposed pipeline route. These have resulted from consideration of legal requirements, avoidance of major environmental problems, avoidance of Indian Reservations, avoidance of special Federal lands, and public preferences. Each route segment in the following discussion explains its origin, the description, and an impact analysis by environmental component.

## AROUND PUGET SOUND

### Description

The around Puget Sound pipeline segment would originate at the onshore storage facilities on Green Point in Clallam County, Washington and would intersect the proposed pipeline route at North Bend, Washington, a distance of 198 miles (figure 9.4-2).

After leaving the onshore storage facility, the route would proceed due south, crossing U.S. Highway 101 approximately 6 miles east of Port Angeles and 1 mile south of the tank farm, continue on 2.5 miles, south where it would intersect the Bonneville Power Administration (BPA) transmission line right-of-way. The pipeline would parallel the existing BPA right-of-way across Clallam County and enter Jefferson County southeast of Blyn. The route would cross the Dungeness River Southwest of the town of Sequim. South of Port Discovery Bay, the route would turn southerly and parallel the Hood Canal and U.S. Highway 101, and the BPA right-of-way across Jefferson and Mason Counties for approximately 70 miles. It would cross several major rivers, including the Quilcene, Dosewallips, Duckabush, Hamma Hamma, and the Skokomish, along with several minor rivers and creeks. Just north of the town of Shelton, the route would skirt the edge of the Skokomish Indian Reservation.

South of Shelton, the route would join and parallel the Northwest Pipeline corridor for approximately 20 miles in a southeasterly direction to a point 1 mile east of Interstate 5. The route would leave the Northwest Pipeline corridor and proceed easterly toward the town of Rainier then northeasterly toward the town of Enumclaw. This section would be on approximately 60 percent private right-of-way and 40 percent existing railroad and high-voltage transmission line right-of-way.

The major rivers to be crossed are the Deschutes and Nisqually in Thurston County, the Puyallup and Carbon in Pierce County, and the White River in Pierce and King Counties. North of Enumclaw, the route would parallel the BPA right-of-way in a northerly direction, crossing the Green River west of Kanaskat.

From the BPA substation near Kanaskat, the route would head northwesterly and then northerly, skirting the City of Seattle Cedar River Watershed near Hobart. It would parallel State Highway 18 and the BPA right-of-way to a point near Rattlesnake Mountain.

West of the town of Snoqualmie the route would proceed southeasterly toward North Bend generally paralleling the BPA right-of-way and Interstate 90. Just east of North Bend the around Puget Sound segment would intersect the proposed pipeline route, pipeline mile 128, for a total distance of 198 miles, compared to 128 miles for the proposed route.

## Air Quality

Air pollutant concentrations along the proposed corridor are generally low since the line would traverse mostly rural areas. Sulfur dioxide concentrations exceed the standards in Tacoma, Washington.

High ozone readings occur in the Seattle area primarily in summer. Hourly average concentrations as high as 0.16 parts per million (ppm) were observed in 1978. In that year there were 14 days with violations at one Seattle location. The Non-attainment Area for ozone covers all of the Seattle-Tacoma metropolitan area and extends from Puget Sound eastward to the foothills of the Cascades near North Bend.

Construction of the pump stations and pipeline would result in temporary emissions from combustion engines of construction equipment. The emission level would be small enough that pollution levels outside the immediate construction site would be negligible.

Fugitive dust would be generated during construction activities. However, impacts would be confined to the immediate vicinity of the site and would be of limited duration.

During the operation phase, impacts on air quality are expected to be negligible.

The only pollutants that would be emitted from a typical pump station during the operation phase would be hydrocarbons from the surge tank, if one is installed. Hydrocarbon concentrations near the proposed facilities would not exceed the federal 3-hour average standard of 160 $ug/m^3$, and ordinarily would be negligible.

Emissions from the proposed pipeline would be negligible during the operation of the pipeline and no significant air quality impacts would be expected.

## Noise

Noise levels along the pipeline corridor between Port Angeles and North Bend are generally low. Noise levels would be typical of small towns, with most noise sources originating from local traffic and highways, and light commerical activities.

The State of Washington has established noise regulations. Noise from temporary construction activities between the hours of 7 a.m. and 10 p.m. is specifically exempted.

A limited number of residences would be subject to noise from construction activities at the proposed pump stations. Construction would take place over a period of about 12 months.

Residences located about 1,500 feet from the construction site would experience equivalent noise levels of about 70 dBA. This would cause a significant increase above background levels for rural locations, and might cause some annoyance. Residences located about 4,000 feet from the construction site would experience noise levels of about 55 dBA. Most of the pump stations would be located away from residential areas.

The impact of pipeline construction would be temporary. The intensity and duration of impact would depend on the distance of the receptor from the route alignment. Significant impact may occur up to 4,000 feet from the construction activity but would usually last less than a week.

### Operation Phase

During the operation phase the primary source of noise would be the pump stations. A typical station would be equipped with electrically driven pumps that would produce a noise level of 69 dBA at a distance of about 100 feet. At a distance of 1,500 feet the equivalent level would drop to 50 dBA. At distances beyond 4,000 feet this would be below background levels.

## Topography

This route segment alternative, from the onshore storage facilities (pipeline mile 0) to the intersection with the proposed pipeline (about pipeline mile 196), would cross topography similar to, but slightly steeper than, the proposed route. It would consist of a terrace-like glacial outwash plain dissected by numerous fast flowing streams in relatively steep sided gullies between pipeline mile 0 and 78 (Olympic Mountains), rolling morainal hills with relatively flat areas with broad, steep-sided valleys and aggrading streams between pipeline mile 78 and 180 (Puget Trough), and low (2,000-3,000 feet), moderately steep (15 to 25 percent) mountain peaks and glacial outwash plains between pipeline mile 180 and the intersection with the proposed route (foothills of the Cascade Range).

Topographic impacts along this route segment alternative would be much the same as those that would be encountered along the proposed route. Impacts would be relatively minor, would be visual in nature and would consist primarily of landscape changes. Although this route segment alternative would cross slightly steeper terrain, the amount of land disturbed (about 12 to 18 acres per mile) would be nearly identical to the proposed route.

## Geology

This route segment alternative would encounter geologic material similar to that encountered by the proposed route. It would consist primarily of variable thicknesses (less than 100 to over 300 feet) of Quaternary glacial debris and Quaternary alluvium, underlain by Tertiary volcanic rock (basalt) and nonmarine sediments in the Olympic Mountains (pipeline mile 0 to 78), and Tertiary volcanic (basalt, andesite) and crystalline (granite) rocks and small areas of Mesozoic and Tertiary nonmarine sediments in the foothills of the Cascade Range (pipeline mile 180 to 196), and overlain by two volcanically induced mudflows in the Puget Trough (pipeline mile 145 and 160-168).

Like the proposed route, impacts to the geologic materials along this route segment alternative would be minor and would consist of the removal of large amounts of geologic material and some alteration of the physical characteristics (permeability, porosity, moisture content, etc.) by construction. Although the average slopes along the route segment alternative is slightly greater, the amount of material excavated per mile would be comparable for both routes. Consequently, the geologic impacts would be essentially the same.

### Geologic Hazards

Geologic hazards that could be encountered by this route segment alternative would be the same as those encountered by the proposed pipeline and would consist of seismicity (ground shaking, surface fault rupture, liquefaction), slope instability, and outburst flooding.

### Seismicity

Like the proposed route, this route segment alternative would be within a seismically active area that has been classified by the 1976 Uniform Building Code as a Seismic Risk Zone 3 (maximum earthquake damage expected). However, it has experienced a greater frequency of strong earthquakes (4.8 or greater on the Richter scale), including two that registered 6 or higher.

While several surface fault ruptures have been identified in the immediate vicinity of both routes, only along the route segment alternative are found faults (5) that have shown apparent movement during Quaternary time. Two of these, located near Lake Cushman have shown apparent movement during the Holocene (past 10,000 years) and are considered active. The remaining three faults, Blyn, Bottom peninsula, and Dow Mountain have shown apparent movement during the Pleistocene (2 to 3 million years) and are considered "potentially" active. None of these faults would be directly crossed by the pipeline.

In addition to the five Quaternary faults, several geophysical (magnetic or gravity) anomalies are found in the vicinity of this route segment alternative. Three of these anomalies lie within the pipeline corridor. One is parallel to the pipeline along Hood Canal, and two are crossed by the pipeline at approximately mile 6 and mile 119. These features have been tentatively identified as possible faults and represent potential geologic hazards. However, they may also represent geologic structures that are nontectonic in nature.

Potential liquefaction problems that would be encountered by the around Puget Sound route segment would be in material similar to the proposed route and would be found along the eastern flanks of the Olympic Mountains, Skokomish Valley (pipeline mile 74 to 80), Oyster Bay (pipeline mile 89 to 92), and Lacamus Creek to Muck Creek (pipeline mile 134 to 138).

While both routes are located in an area of high seismic activity, this route segment alternative has experienced more strong earthquakes than has the proposed route. It would also pass within 2 miles of two active faults (near Lake Cushman), and three potentially active faults (Blyn, Bottom Peninsula, and Dow Mountain) and encounter more zones of potential liquefaction. Consequently, the potential impacts from seismic activity (ground shaking, surface fault movement, and liquefaction) would be significantly greater along the route segment alternative than along the proposed route.

### Slope Instability

Although areas of slope instability are found along both routes, the higher level of seismic activity and more recent fault movement along the route segment alternative has created more unstable and potentially unstable slopes than along the proposed route. This is particularly true along the eastern flanks of the Olympic Mountains and the western foothills of the Cascade Range, where large landslides have occurred near Mount Walker (pipeline mile 36 to 39), Mount Turner/Green Hill (pipeline mile 40.6 to 42.5), Dow Mountain (pipeline mile 66 to 68), and Tiger Mountain (pipeline mile 180 to 185). Consequently, the anticipated impacts from slope instability would be substantially greater along the route segment alternative.

### Outburst Flooding

While outburst floods could occur along both routes, only those locations with the greatest potential for outburst flooding are identified. All of these are found along the route segment alternative and consist of the Dosewallips River (pipeline mile 44), Nisqually river (pipeline mile 128), Puyallup River (pipeline mile 148), White River (pipeline mile 159), Green River (pipeline mile 171) and Cedar River (pipeline mile 175). Consequently, potential impacts (stream scour and stream bank erosion) would be much higher and pose a greater threat to pipeline integrity along the route segment alternative than along the proposed route.

### Mineral Resources

As neither route would cross active mineral recovery operations or known areas of high mineral development potential, anticipated impacts would be identical.

## Soils

A review of published soil surveys indicates that approximately 75 percent of the soils are underlain by glacial deposits, 13 percent are mountainous, 7 percent are underlain by bedrock, 3 percent are alluvial, and 2 percent are organic. About 10 percent are poorly drained. Total amount of fair to good productive soils is about 600 acres, two-thirds of which could be classified as prime farmland. This compares with 320 acres of prime farmland that would be traversed by the proposed route. Stongly sloping and very steep slopes total about 560 acres, whereas only 150 acres of similar lands would be encountered along the proposed route. High seasonal water tables occur on 1,290 acres as compared with 530 acres on the proposed route.

Pacific Border

This physiographic region consists of the Olympic Mountains and Puget Trough subregions. The former extends from the begininng of the route to approximately pipeline mile 78. Soils are moderately deep to shallow loams, gravelly loams, and silty clay loams with fine-grained alluvial deposits throughout. Dominant soil series are Clallam, Hoodsport, Shelton, Grove, and unidentified soils of rough, mountainous lands. Steep slopes with gradients ranging to 50 percent occur. Water erosion potential would be high on those slopes. Shrink-swell potential is low. Corrosivity to steel is medium to high. High water tables (to within 12 inches of the surface) are common on nearly level to gently sloping lands. Many soils have high compressibility and low structural bearing capacity. Topsoil suitability for revegetation is generally poor.

The Puget Trough subregion extends approximately from pipeline mile 78 to 180. Soils are highly permeable, gravelly, and stony loams formed in alluvium. Principal soil series are Everett, Tumwater, Spanaway, Alderwood, and Buckley. Perched groundwater tables occur 2 to 3 feet below ground surface. Slopes are nearly level to moderately sloping and occasionally steep. Surface textures are mostly gravelly silt loams and sandy loams. Depths to cobble and gravel are 2 to 5 feet. Permeabilities range from slow to moderately rapid. Shrink-well potential is low. Steel corrosion potential is high to medium. Potential for wind erosion is low; water erosion potential is low to medium.

The abundance of surface gravel make these topsoils undesirable for revegetation but desirable for erosion control. Chief limitations of the Puget Lowlands soils are cemented hardpans, gravelly and cobbly subsoils, poor drainage, and occasional small areas of peat and muck.

Cascade Range

The few miles between pipeline mile 180 and the intersection with the proposed route east of North Bend the around Puget Sound segment is in the westernmost section of the Cascade Range. Soils may be shallow gravelly, stony, and medium textured on gentle to steep slopes.

Construction operations might remove vegetative ground cover from the length and width of the pipeline right-of-way and the pump station sites and from access roads that would be required in excess of the present available roads. Soils on an area of 2,300 acres would be disturbed, compared to 1,300 acres on the proposed route.

Annual soil loss ranging from 2 to 50 tons per acre could occur from water erosion. Actual amounts would depend upon topography, precipitation, and the degree of soil cover removal during construction. These rates would be reduced to less than 5 tons per acre per year after complete revegetation.

Soils of marshes, peat bogs, and other seasonally wet areas could be severely impacted by pipeline construction. An estimated 45-50 acres could be reduced in productive capacity by as much as 25 percent for several years.

Other impacts such as soil loss by dust emission and loss of productive capacity because of soil profile mixing, compaction, and oil spills would be similar to those discussed for the proposed route.

Aquatic Recources

Water Quality

The pipeline route segment would cross the Puget Sound Basin from the onshore storage facility (pipeline mile 0) to North Bend, Washington. Seventeen (17) major streams would be crossed in the basin.

Selected river characteristics for Puget Sound Basin rivers are summarized in table 9.4-11. Width, depth, velocity, gradient, scour depth, and streambed composition are based on field inspections of the proposed river crossings in spring of 1978. Low flow and 100-year flow flood plain widths are based on U.S. Geological Survey (USGS) gaging stations at or near the proposed crossings and/or by county flood-hazard maps.

Variation of discharge for gaging stations near the major river crossings are presented in table 9.4-12. Instantaneous minimum and maximum discharges recorded in cubic feet per second (cfs) for the period of record and for the 1976 water year (October 1, 1975 through September 30, 1976) are listed if data are available. The most current year of record is used for stations that were discontinued before the 1976 water year. Mean monthly discharges for April through November are based on 1976 or most current year of record. All discharge measurements are taken from U.S. Geological Survey published records, except as noted. Seven-day low flows with a 10-year recurrence interval are included when data are available (Pacific Northwest River Basins Commission (PNRBC) Ap. III, Tab. 30).

Water Quality data for major river crossings are summarized in table 9.4-13.

Puget Sound Basin-Groundwater

The Puget Sound Basin, pipeline mile 0 to 205, can be subdivided into two groundwater regions, the Puget Sound Lowlands and the Puget Sound Lowland-Cascade Range transition zone.

The most significant aquifers in the Puget Sound Lowlands, pipeline mile 0 - 120, are the alluvial and glaciofluvial deposits covering the valley floors and lowlands (PNRBC 1970). Water levels in the unconfined aquifers lie between 25 and 50 feet below the surface, with perched zones that have water levels of 10 feet or less (Molenaar and Noble 1970). Recharge is primarily from precipitation and secondarily from runoff. Discharge is through springs, both onshore and offshore. Water is used for domestic, agriculutral, and livestock purposes.

Groundwater in the Puget Sound Lowland-Cascade Range transition zone, pipeline mile 120 to 125, is generally encountered within 0 to 50 feet of the land surface. Areas of shallow water that may be less than 10 feet below the surface exist in the vicinity of pipeline mile 134 and 140 and in river and stream valleys between pipeline mile 144 and 198 (Luzier 1969).

Recharge to the unconfined aquifer is from rainfall and snowmelt in the transition zone. Discharge, particularly in the more mountainous region of the transition zone, is through springs which are the principal supply to streams during late summer (PNRBC 1970). Use of ground water from the unconfined zone is for domestic, irrigation, and livestock supply.

TABLE 9.4-11 CHARACTERISTICS OF MAJOR RIVER CROSSINGS--PUGET SOUND BASIN

| River Crossing | | | | | | | | 100 Year Flow | | Low Flow | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Pipeline Mile | Survey Date | Width (feet) | Depth (feet) | Velocity (ft/sec) | Gradient (ft/100ft) | Scour Depth (feet) | Max.Width (feet) | Expected Occurrence | Max.Width (feet) | Expected Occurrence | Stream Bed Composition |
| Dungeness | 10 | 4/78 | 50 | 2 | 3-5 | 2.5 - 3 | 10 | 270-350 | Dec-Feb | 20± | June-Aug | Coarse gravel, cobbles, boulders |
| Little Quilcene | 34 | 4/78 | 50 | 1.5 | 2 | 1 | 4 | 120 | Dec-Feb | 20± | July-Sep | Sand, gravel |
| Big Quilcene | 35 | 4/78 | 65 | 2 | 3 | 2 | 4-6 | 70 | Nov-Feb | 20 | July-Sep | Sand, gravel |
| Dosewallips | 44 | 4/78 | 60 | 2 | 7-8 | 3 | 4-8 | 250 | Jan-Mar | 40-60 | July-Sep | Coarse gravel, cobbles |
| Duckabush | 48 | 4/78 | 70 | 35 | 5-6 | 0.5-1.5 | 8-10 | 200 | Dec-Jan | 40-60 | July-Sep | Gravel, cobbles |
| Hamma Hamma | 57 | 4/78 | 100 | 3 | 2.5-3 | 0.25 | 6 | 140 | Dec-Feb | 60-80 | July-Aug | Silt, sand, gravel |
| Skokomish | 76 | 4/78 | 150 | 3 | 2.5 | 0.33 | 5-6 | 500 | Dec-Feb | 100 | July-Sep | Gravel, cobble |
| Black | 102 | 4/78 | 3500 | 4+ | 0 | 0 | 4 | - | - | - | - | Peat, silt, sand, gravel |
| Deschutes | 114 | 4/78 | 30 | 4 | 3 | 0.5 | 3-5 | 250± | Dec-Feb | 25-30 | July-Aug | Cobbles, sand, gravel |
| Nisqually | 128 | 4/78 | 140 | 8 | 2.5 | 0.25 | 8-10 | 230± | Dec-Feb | 50-75 | July-Sep | Silty sand, gravel, cobbles |
| Puyallup | 146 | 4/78 | 125 | 6 | 4.7 | 3 | 6-8 | 260 | Nov-Mar | 25-40 | July-Sep | Gravel, cobbles boulders |
| Carbon | 152 | 4/78 | 35-40 | 2.5 | 3 | 1 | 4-6 | 300 | Nov-Mar | 30± | July-Sep | Cobbles, boulders |
| White | 159 | 4/78 | 85 | 4 | 5 | 3 | 6-10 | 1400 | Dec-Feb | 30-40 | July-Sep | Sand, gravel, cobbles, boulders |
| Green | 170 | 4/78 | 80 | 4 | 5 | 5 | 2-4 | 160-180 | Dec-Feb | 40 | Aug-Sep | Silt, sand cobbles, boulders |
| Cedar | 176 | 4/78 | 70 | 3-4 | 6-7 | 1 | 4-8 | 120 | Dec-Feb | 40 | July-Sep | Sand, gravel, cobbles, boulders |
| Raging | 185 | 4/78 | 50 | 1-2 | 5-15 | 6 | 2-4 | 100± | Dec-Feb | 10-20 | July-Sep | Gravel, cobbles boulders |
| S. Fork Snoqualmie | 197 | 4/78 | 30 | 3-4 | 7-8 | 3-5 | 3-5 | 500 | Dec-Feb | 20-40 | Aug-Oct | Sand, gravel cobbles |

Source: Adapted from river crossing reports prepared for NTPC.

TABLE 9.4-12 ESTIMATED WATERSHED DISCHARGE DATA--PUGET SOUND BASIN

| River Crossing Name | Station No | Period of Record | Extremes (cfs) | | | | | Means (cfs) | | | | | | | | | Average Discharge | Low Flow (10 yr. re.) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pd. of Record | | Most CY Data | | | | | | | | | | | | Period of Record | | |
| | | | Min. | Max. | Min. | Max. | Year | Year | April | May | June | July | Aug. | Sept. | Oct. | Nov. | | 7-Day | 30-Day |
| Dungeness | 12048000 | 1937-1976 | 68 | 6,820 | 139 | 5,150 | 1976 | 1976 | 297 | 627 | 589 | 593 | 337 | 200 | 200 | 727 | 394 | 95 | 109 |
| *B. Quilcene | 12052500 | 1971-1972 | 55 | 316 | | | | | | | | | | | | | 177.2 | | |
| Duckabush | 12054000 | 1938-1976 | 45 | 8,960 | 89 | 5,780 | 1976 | 1976 | 268 | 525 | 427 | 445 | 228 | 116 | 817 | 852 | 422 | 58 | 70 |
| Hamma Hamma | 12054500 | 1951-1970 | 39 | 6,010 | 39 | 6,010 | 1966 | 1966 | 440 | 522 | 409 | 272 | 135 | 77.7 | 101 | 456 | 364 | 43 | 50 |
| Skokomish | 12061500 | 1943-1976 | 125 | 27,000 | 193 | 20,200 | 1976 | 1976 | 1,130 | 874 | 600 | 459 | 297 | 225 | 2,570 | 3,518 | N/A | 151 | 158 |
| Deschutes | 12079000 | 1959-1975 | 16 | 7,780 | 31 | 3,740 | 1975 | 1975 | 189 | 192 | 73.5 | 46.6 | 53.8 | 51.7 | 373 | 306 | 270 | 80 | 83 |
| Nisqually | 12088400 | 1969-1976 | 176 | 30,700 | 670 | 30,700 | 1976 | 1976 | 1,657 | 1,498 | 1,053 | 1,051 | 1,051 | 1,012 | 1,518 | 2,728 | 1,866 | 42 | 83 |
| Puyallup | 12093500 | 1931-1976 | 25 | 15,300 | 179 | 8,850 | 1976 | 1976 | 611 | 862 | 721 | 812 | 671 | 467 | 519 | 980 | 718 | 188 | 260 |
| Carbon | 12093900 | 1965-1976 | 73 | 7,480 | 115 | 7,460 | 1976 | 1976 | 295 | 576 | 523 | 619 | 446 | 285 | 343 | 600 | 445 | | |
| S. Prairie | 12095000 | 1949-1970 | 20 | 6,850 | 34 | 1,890 | 1970 | 1966 | 266 | 191 | 194 | 173 | 52.6 | 60 | 101 | 118 | 242 | 30 | 35 |
| White | 12098500 | 1938-1976 | 59 | 17,000 | 48 | 12,700 | 1976 | 1976 | 1,432 | 2,117 | 2,064 | 1,862 | 1,237 | 890 | 906 | 1,714 | 1,472 | 340 | 440 |
| Green | 12106700 | 1963-1970 | 26 | 9,430 | 100 | 6,900 | 1970 | 1966 | 1,904 | 1,209 | 579 | 492 | 132 | 125 | 443 | 405 | 979 | 107 | 120 |
| Cedar | 12117500 | 1895-1970 | 83 | 14,200 | 206 | 1,620 | 1970 | 1966 | 973 | 970 | 851 | 517 | 315 | 310 | 261 | 450 | 695 | 184 | 210 |
| Raging | 12145500 | 1963-1970 | 4.4 | 3,420 | 10 | 1,230 | 1970 | 1966 | 169 | 87.5 | 43 | 52.1 | 17.7 | 14.6 | 49 | 119 | 145 | 6.9 | |
| South Fork Snoqualmie | 12143400 | 1960-1970 | 28 | 7,090 | 28 | 1,440 | 1970 | 1966 | 520 | 621 | 440 | 219 | 61.3 | 38.3 | 133 | 225 | 295 | 83 | 92 |

Source: US Geological Survey
* EPA STORET DATA

TABLE 9.4-13 WATER QUALITY CHARACTERISTICS OF MAJOR STREAMS CROSSED--
PUGET SOUND BASIN

| River Crossing | | Period of Record or Date | State Classification | Temperature (°C) | | pH | | Dissolved Oxygen (mg/l) | | Specific Conductance (rmhos/cm) | | Dissolved Solids (mg/l) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Station Number | | | Mean | Range | Mean | Range | Mean | Range | Mean | Range | Mean | Range |
| Dungeness | 12048000 Near Sequim | 1959-1970 | A | 8.7 | 2.4-16.1 | 7.6 | 6.3-8.0 | 11.4 | 9.7-13.5 | 112 | 117-152 | 65 | 54-78 |
| Big Quilcene | 17A070 Near Quilcene | 1959-1966 | AA | 8.7 | 3.6-17.9 | 7.5 | 6.8-8.0 | 11.6 | 9.8-13.5 | 100.1 | 71-158 | 62 | 43-94 |
| Dosewallips | 16D070 Near Brinnon | 1959-1974 | AA | 8.6 | 3.9-15.5 | 7.5 | 6.9-7.9 | 11.5 | 10-13.6 | 87 | 57-117 | 53 | 38-72 |
| Duckabush | 12054100 Near Mouth | 1960-1972 | AA | 8.2 | 4.1-15.1 | 7.4 | 7.1-7.9 | 11.9 | 8-13.9 | 444 | 46-5,550 | 46 | 32-133 |
| Hamma Hamma | 16B070 Near Eldon | 1961-1972 | AA | 8.6 | 4.8-13 | 7.3 | 6.8-7.7 | 12 | 11.0-13.9 | 209 | 41-2,400 | 42 | 32- 77 |
| Lilliwaup | HCB560 | 1933 | A | 9.0 | 8.0-10.1 | 8.2 | 8. -8.5 | 4.9 | 4.3-5.5 | No Data | No Data | No Data | No Data |
| Skokomish | 12061500 Near Potlatch | 1960-1978 | AA | 8.7 | 4.4-15.3 | 7.3 | 6.7-7.2 | 11.2 | 9.6-15 | 64 | 27-89 | 45 | 31-53 |
| Deschutes | 12079004 Near Rainier | 1959-1978 | A | 9.9 | 2.3-18 | 7.3 | 6.6-7.7 | 11 | 8.0-13.1 | 92 | 49-186 | 67 | 46-91 |
| Nisqually | 12088400 Above Powell Creek | 1972-1978 | A | 8.3 | 4.2-13.4 | 7.3 | 6.9-7.6 | 11.6 | 9.9-13 | 59 | 40-95 | No Data | No Data |
| Puyallup | 10A110 Near Orting | 1955-1978 | A | 8.0 | 1 -19 | 7.2 | 6.2-7.9 | 11.8 | 9.2-14.3 | 52 | 35-78 | 44 | 4-65 |
| Carbon | 12093900 At Fairfax | 1975-1976 | A | 7.8 | 2.8-14.4 | 7.3 | 6.7-7.3 | 11.8 | 10.2-13 | 33 | 17-50 | No Data | No Data |
| S. Prairie | 12095300 Near Crocker | 1975-1976 | A | 9.6 | 4.1-17 | 7.4 | 6.9-8.3 | 11.8 | 9.6-13.3 | 75 | 34-103 | No Data | No Data |
| White | 10C110 Below Buckley | 1972-1973 | A | 10.9 | 0.18-5 | 7.8 | 6.9-9.0 | 12.4 | 9.3-16 | 88 | 44-120 | No Data | No Data |
| Green | 09A190 Near Kanaskat | 1959-1978 | AA | 8.6 | 2 -18 | 7.3 | 6.8-7.8 | 11.7 | 9.4-13.4 | 45 | 29 -71 | 36 | 28-46 |
| Cedar | 08C110 Near Landsburg | 1959-1978 | AA | 9.1 | 4 -14.5 | 7.5 | 7 -8 | 11.6 | 9.7-17.5 | 58 | 37 -88 | 38 | 27-51 |
| Raging | 070902 Near Fall City | 1971-1972 | No Data | 5.7 | 0.6-15 | 6.8 | 6 -8.7 | 12.7 | 10.2-14.7 | 57 | 33-220 | No Data | No Data |
| South Fork Snoqualmie | 07D130 At Snoqualmie | 1959-1978 | AA | 9.0 | 2.5-17.5 | 6.9 | 6.2-7.5 | 11.2 | 8.2-14 | 37 | 16-61 | 25 | 14-38 |

Source: U.S. Geological Survey & EPA Storet Data

The groundwater is generally good quality, with constitutents well within U.S. Environmental Protection Agency drinking water limits. This water is of the calcium-magnesium bicarbonate type (Walters and Kimmel 1968). Most of the groundwater contains less than 200 parts per million (ppm) of dissolved solids although higher concentrations may occur near shore lines as a result of seawater encroachment (PNRBC 1970 App. III). The hardness of the water varies from soft, less than 60 milligrams per liter (mg/l) to hard, over 200 mg/l. Iron concentrations may be high in localized areas within the basin. High sulfate concentrations are present in some of the Cascade Range aquifers.

Pipeline construction would affect surface water quality by increasing suspended sediment and turbidity during clearing, trenching, pipe installation, and backfilling operations. Sediment in runoff water from the cleared right-of-way would reach surface water. The amount of sediment contributed would depend on intensity, duration and frequency of rainfall, soil type, and the length and angle of the slope adjacent to the streambank. At major river crossings potential sediment from trenching activities would range from 2 to 6.5 cubic yards per foot of stream channel width, depending on trench depth and trench wall collapse. Suspended sediments would be carried varying distances downstream before they settled out, depending on stream velocity, slope and size of sediment particles. Generally the smaller the particule the farther downstream it would be carried. Trench size, stream velocity crossing width, streambed composition, and estimated increase in suspended sediment concentration from major streams crossed by the proposed route are included in table 9.4-14.

Most streams would eventually flush themselves and return to preconstruction quality. Short-term increases in turbidity, total suspended solids, and color would decrease light penetration, and subsequently lessen photosynthetic activity. Potential organic load increases caused by streambed disturbance, such as resuspended decomposing organic material, could exert a higher oxygen demand and thus reduce the dissolved oxygen content of the water. Reoxygenation caused by turbulent river flow and the diffusion of atmospheric oxygen would eventually replenish the depleted dissolved oxygen. Dilution by inflow of cleaner water would decrease turbidity, color, and nutrient levels. Generally, impacts on water quality from construction would be short term, lasting less than 1 month.

Ground water flow characteristics would not be significantly affected by the construction of the pipeline, although some pipeline sections would lie below the water table. During construction, dewatering of the trench in seasonally high water table regions would be required. The displaced ground water could be pumped into adjacent drainages where it would recharge aquifers, or be mixed with other surface water without change in quality.

The pipe would be hydrostatically tested for leaks. Test water would be withdrawn from streams and rivers along the route at a proposed rate of 6 cubic feet per second. If tests were conducted during periods other than low flow no significant impacts would occur. For test water with dissolved oxygen content greater than 13 milligrams per liter, soda ash could be added as a pipe corrosion preventative. The pH of the test water would be raised to 9. To avoid anerobic bacterial corrosion, a bacteriacide would be added to test waters remaining in the pipe for longer than 2 months. Raised pH and bacteriacide impacts could occur in test water discharge areas. Intensity of impact would depend on dilution effect of the stream flow,

TABLE 9.4-14 ESTIMATED SEDIMENTATION DURING CONSTRUCTION PHASE

| Basin-River | Pipeline Mile | Trench Size Length (ft.) | Trench Size Depth (ft.) | Trench Size Width (ft.) | Trench Volume (cu.yd.) | Stream Velocity (cfs) | Streambed Composition | Sediment Increase (ppm) |
|---|---|---|---|---|---|---|---|---|
| Puget Sound Basin | | | | | | | | |
| Dungeness | 10 | 35 | 19 | 6.5 | 305 | 200 | Gravel, cobbles, boulders | 1,300 |
| Little Quilcene | 34 | 35 | 13 | 6.5 | 178 | 100 | Sand, gravel | 3,400 |
| Big Quilcene | 35 | 45 | 15 | 6.5 | 280 | 150 | Sand, gravel | 2,250 |
| Dosewallips | 44 | 50 | 17 | 6.5 | 370 | 225 | Gravel, cobbles | 2,000 |
| Duckabush | 48 | 60 | 20 | 6.5 | 565 | 200 | Gravel, cobbles | 2,200 |
| Hamma Hamma | 57 | 80 | 15 | 6.5 | 498 | 180 | Silt, Sand gravel | 3,500 |
| Skokomish | 76 | 125 | 15.5 | 6.5 | 815 | 250 | Gravel, cobbles | 1,850 |
| Black | 102 | 1,750 | 12 | 6.5 | 12,260 | 0 | Peat, silt, sand, gravel | -- |
| Deschutes | 114 | 30 | 15 | 6.5 | 187 | 140 | Cobbles, sand, gravel | 2,550 |
| Nisqually | 128 | 100 | 22 | 6.5 | 1,085 | 900 | Silty sand, gravel, cobbles | 750 |
| Puyallup | 146 | 75 | 19 | 6.5 | 656 | 350 | Gravel, cobbles, boulders | 1,050 |
| Carbon | 152 | 35 | 15 | 6.5 | 222 | 200 | Cobbles, boulders | 800 |
| White | 159 | 60 | 20 | 6.5 | 565 | 700 | Sand, gravel, cobbles, boulders | 770 |
| Green | 170 | 60 | 14 | 6.5 | 338 | 450 | Silty sand, cobbles, boulders | 1,050 |
| Cedar | 176 | 55 | 18 | 6.5 | 442 | 300 | Sand, gravel, cobbles, boulders | 1,800 |
| Raging | 185 | 30 | 13 | 6.5 | 552 | 70 | Gravel, cobbles, boulders | 5,350 |
| S. Fk. Snoqualmie | 197 | 25 | 15 | 6.5 | 156 | 150 | Sand, gravel, cobbles | 2,300 |
| S. Fk. Snoqualmie | 202 | 70 | 20 | 6.5 | 682 | 150 | Gravel, cobbles | 3,100 |

Roger Lowe Associates, 1978

Juvenile salmon released from the Dungeness Hatchery upstream migrate through this reach of the Dungeness River in Western Washington on their way to the ocean.

background pH, and the volume of hydrostatic test water discharged. Temperature of discharged test water would probably range from 50°F to 60°F. If temperatures for streams receiving test water were considerably higher or lower than the 50°F to 60°F range, a short-term, localized impact would result.

The discharge procedure for the test water could be a source of impact. If discharged into a stream under pressure, it could cause gouging erosion, undercutting, or dispersion of bank and bottom sediments. Discharge into a treating pond and then to an existing waterway could create other impacts. Percolation of hydrotest water from the holding pond could contaminate subsurface aquifers, or a leak in the impoundment would allow untreated water to flow over the landscape. If discharge of treated test water were released via siphon or low pressure pumping no significant impact would result.

No impact on groundwater is expected from hydrostatic testing unless a rupture of the pipeline occurs. Areas of seasonally high or perched water tables could be contaminated with treated test water. If no soda ash or bacteriacide were added to the test water, no water quality degradation would occur.

Under the operation phase, only minor impacts from maintenance are anticipated. Seasonal flooding would be expected in uncontrolled rivers. Major runoff events could expose the buried pipe and necessitate maintenance operations. Short-term sediment impacts would occur at the crossings and downstream. Impacts would be similar, although of less intensity, and duration, than those at construction operations.

The most significant impact of pipeline operation would result from a pipeline rupture spilling oil into surface or ground water. For new piplines, there is a leak rate of 0.0022 leaks per mile per year (OIW 1978).

In the chance of a spill, the severity of impact on stream water would depend on the amount of oil spilled, chemical constituents of the oil, time before oil containment, topography of the area, volume of stream flow, and time of year. Table 9.4-15 represents maximum potential oil spills based on block and check valve locations, length of crossing, shutdown and leak detection time (12 minutes), and volume of thoughput at all major river crossings requiring a U. S. Army Corps of Engineers permit.

## Biological Components

Major cold water species include five species of salmon and five species of trout. All of the salmon and three species of trout hatch in freshwater, migrate as juveniles to saltwater where they live until maturity, and return to freshwater as adults to spawn (anadromous or searun). The salmon die after spawning. The other two species of trout spend their life cycle entirely in freshwater.

Salmon contribute to the marine commercial, sport, and Indian fisheries and to the freshwater sport and Indian fisheries. Resident trout are limited to freshwater sport angling. Anadromous trout (mostly steelhead) contribute to both the ocean and freshwater sport and Indian fisheries. Some western Washington streams have been identified as significant habitat for these species.

TABLE 9.4-15 MAXIMUM POTENTIAL OIL SPILL

| | | Length of Crossing (ft) | Throughput Volume-Barrels Per Day (BPD) | | | |
|---|---|---|---|---|---|---|
| | | | 709,000 BPD | | 933,000 BPD | |
| Basin-River Crossing | Pipeline Mile | Valve to Valve | Min. Detected Spill (bbl) | Max. Spill (bbl) | Min. Detected Spill (bbl) | Max. Spill (bbl) |
| Puget Sound Basin | | | | | | |
| Dungeness | 10 | 560 | 950 | 6830 | 960 | 8700 |
| Little Quilcene | 34 | 320 | 560 | 6440 | 570 | 8310 |
| Big Quilcene | 35 | 280 | 490 | 6370 | 500 | 8240 |
| Dosewallips | 44 | 440 | 760 | 6630 | 770 | 8500 |
| Duckabush | 48 | 400 | 690 | 6570 | 700 | 8440 |
| Hamma Hamma | 57 | 720 | 1220 | 7100 | 1230 | 8970 |
| Skokomish | 76 | 720 | 1220 | 7100 | 1230 | 8970 |
| Black | 102 | 3840 | 6360 | 12.240 | 6370 | 14,110 |
| Deschutes | 114 | 560 | 950 | 6830 | 960 | 8700 |
| Nisqually | 128 | 800 | 1350 | 7230 | 1360 | 9100 |
| Puyallup | 146 | 920 | 1550 | 7430 | 1560 | 9300 |
| Carbon | 152 | 640 | 1080 | 6960 | 1090 | 8830 |
| White | 159 | 1600 | 2670 | 8550 | 2680 | 10,420 |
| Green | 170 | 400 | 690 | 6570 | 700 | 8440 |
| Cedar | 176 | 320 | 560 | 6440 | 570 | 8310 |
| Raging | 185 | 440 | 760 | 6640 | 770 | 8510 |
| S. Fork Snoqualmie | 197 | 2160 | 3590 | 9470 | 3600 | 11,340 |

South Fork Snoqualmie River

There are no known threatened or endangered fish species along this pipeline route segment according to the list published by the U.S. Fish and Wildlife Service. This list was published in accordance with Public Law 93-205, The Endangered Species Act of 1973.

The following tables are included to identify the fisheries resources along the pipeline corridor: table 9.4-16 identifies major drainages, the streams crossed, the pipeline mile, and the fish species of concern in each stream. An overall evaluation of the fishery within each stream is also provided. Table 9.4-17 presents information about the anadromous fisheries resources in selected western Washington streams.

Minor impacts on fishery resources would result from vegetation removal and test water discharge during the project construction phase. Removal of streamside vegetation would decrease escape and resting cover for fish, decrease the quantity of terrestrial insects dropping into the stream as food items for fish, and increase water temperatures through shade reduction. The extent of these impacts would depnd on the density and type of vegetation, the percentage of stream covered by vegetation, and on the stream characteristics and fish habitat at specific sites. These impacts would last for the life of the project since only low shrubs would be allowed to become reestablished; they would be minor since only short stream segments would be affected.

Instream trenching activities would destroy undercut banks which serve as fish resting and hiding areas. As habitat is destroyed, fish would not be killed, but rather displaced to other areas within the stream, thus increasing competition with other fish. Both adult and juvenile fish would be impacted. This impact would last for the life of the project and would reduce the number of fish inhabiting the disturbed area. Fish numbers in undisturbed areas, where competition has increased would tend to remain constant, reducing fish populations.

Hydrostatic test water would be withdrawn and discharged at the end of the construction phase. Fish entering the pipe during water withdrawal and entrained in the system would suffer 100 percent mortality because of pressures generated in the pipe. It is not expected that the number of fish impacted in this manner would be significant. There would be no significant impact resulting from test water discharge.

Fuel oil could be spilled by equipment operated near streams. Spills would probably be of short duration and volumes would probably be limited to a few gallons or less. Because of dilution and low volumes, minor impacts would be expected. The impact would be similar to that for a pipe rupture described in the operation phase.

More serious impacts would result from sedimentation of streambeds in spawning areas and in areas where large concentrations of aquatic insects are produced. Sediments would originate from two sources: the streambank and streambed. The removal of streamside vegetation during the construction phase would expose large areas of soil on the streambanks. These would be subject to erosion until revegetaion occurred Factors which would influence erosion include percent and length of slope, soil type and disturbance, amount of precipitation, and runoff patterns. Sediment would begin to enter the streams early in the construction phase (depending on runoff) as vegetation was removed and soil was disturbed. Instream trenching activities would cause downstream sedimentation as disturbances to the streambed occurred. Sediment arising from instream trench excavation would be most noticeable during the actual construction activity which would last several days in most cases. Factors influencing the

TABLE 9.4-16 PIPELINE CROSSING LOCATIONS ON SELECTED WASHINGTON STREAMS AND AFFECTED HABITATS HATCHERIES AND FISHERIES

| Main Stream | Pipeline Mile1/ | Miles of Spawning Habitat2/ | Significant Spawning Habitat3/ | River Mile Crossing Location4/ | Name and Location of Hatchery Facility5/ | Indian Fishery6/ |
|---|---|---|---|---|---|---|
| Siebert Creek | 3 | 8 | -- | 4 | -- | Lower Elwha Klallam Band Usual and Accustomed Fishing Areas |
| Dungeness River | 10 | 36 | 0 - 16 | 8 | Dungeness Hatchery on main stem at RM 10. Hurd Creek Station on Hurd Creek near RM 3. | |
| Jimmycomelately Creek | 18 | 2 | -- | 2 | -- | |
| Salmon Creek | 25 | 2 | -- | 2 | -- | |
| Snow Creek | 26 | 5 | -- | 2 | -- | |
| Little Quilcene River | 34 | 7 | 0 - 5 | 1 | -- | |
| Big Quilcene River | 35 | 9 | 0 - 9 | 1 | Quilcene National Hatchery on Penny Creek near RM 3. | |
| Dosewallips | 44 | 14 | 0 - 14 | 1 | | |
| Duckabush | 48 | 7 | 0 - 3 | 1 | -- | |
| Hamma Hamma | 57 | 3 | 0 - 3 | 1 | -- | |
| Finch Creek | 68 | Unknown | | 3 | Hood Canal Hatchery on Finch Creek at mouth. | |
| Skokomish | 76 | 9 | 1 - 8 | 6 | George Adams Hatchery on Purdy Creek near RM 4. | Skokomish Indian Fishery on lower 6 miles. |
| Deschutes River | 114 | 40 | 2 - 33 | 16 | Tumwater Falls Fish Facility on mainstem below RM 1. | -- |
| Nisqually River | 128 | 40 | 3 - 42 | 25 | -- | Nisqually Indian Fishery on lower river. |
| Puyallup River | 146 | 40 | 10 - 46 | 27 | | Muckleshoot Indian Fishery on lower river. |
| Voight Creek | 149 | 4 | | 3 | Puyallup Salmon Hatchery on Voit Creek below RM 1. | |
| Carbon River | 152 | 25 | 0 - 12<br>18 - 28 | <br>8 | --<br>-- | --<br>-- |
| South Prairie Creek | 156 | 14 | 0 - 14 | 8 | -- | -- |
| White River | 159 | Unknown | 3 - 21 | 26 | -- | Muckleshoot Indian Fishery on lower river. |
| Green River | 170 | 33 | 22 - 52 | 54 | Green River Salmon Hatchery on Soos Creek near RM 34. | Indian Fishery on lower Duwamish River. |
| Cedar River | 176 | 21 | 0 - 19 | ~21 | -- | Muckleshoot Indian Fishery in Lake Washington. |
| Carey Creek | 178 | Unknown | -- | 2 | Issaquah Salmon Hatchery 8 miles downstream from Carey and Holder crossings. | -- |
| Holder Creek | 179 | Unknown | -- | 1 | | |
| Raging River | 185 | 9 | 0 - 9 | 8 | | |
| Snoqualmie River | 197-202 | 40 | 20 - 37 | 55, 60 | | |

1/Pipeline mile where crossing would occur.

2/Approximate number of miles of of spawning and rearing habitat for anadromous and resident salmon and trout on stream mainstem. Includes areas both upstream and downstream from proposed pipeline crossing. Sources: Puget Sound Task force, 1970; Catalog of Washington Stream, 1975.

3/Location of significant spawning areas for anadromous and resident salmon and trout by river mile. Source: Puget Sound Task Force, 1970.

4/Approximate location of proposed pipeline crossing by river mile from the mouth.

5/Name and location of hatchery. River mile number is that of the main stream where fish released from the hatchery would enter.

6/Name and location of Indian river fishery. Additional Indian Fisheries. May occur on other streams.

Note: For additional information see figure 9.4-11.

TABLE 9.4-17 FISH OCCURRENCE AND FISHERY VALUE IN WESTERN WASHINGTON STREAMS

| | Puget Sound Drainage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Stream | Pipeline Mile 1/ | Fishery Value 2/ | Chinook | Coho | Pink | Chum | Sockeye | Steelhead | Other Searun Trout | Resident Trout |
| Siebert Creek | 3 | H | | + | + | + | | + | + | + |
| Dungeness River | 10 | H | + | + | + | + | | + | | + |
| Jimmycomelately Creek | 18 | H | | + | | + | | + | + | + |
| Salmon Creek | 25 | H | | + | | + | | + | + | + |
| Snow Creek | 26 | H | | + | | + | | + | + | + |
| Little Quilcene River | 34 | H | + | + | + | + | | + | + | + |
| Big Quilcene River | 35 | H | + | + | + | + | | + | + | + |
| Dosewallips River | 44 | H | + | + | + | + | | + | + | + |
| Duckabush River | 48 | H | + | + | + | + | | + | + | + |
| Hamma Hamma River | 57 | H | + | + | + | + | | + | + | + |
| Lilliwaup Creek | 64 | H | | + | | + | | + | + | + |
| Skokomish River | 76 | H | + | + | + | + | | + | + | + |
| Goldsborough Creek | 83 | H | + | + | | + | | + | + | + |
| Gosnell Creek | 86 | H | | + | | + | | + | + | + |
| Skookum Creek | 89 | H | + | + | | + | | + | | + |
| Kennedy Creek | 92 | H | + | + | | + | | + | | + |
| Deschutes River | 114 | H | + | + | | + | | + | + | + |
| Nisqually River | 128 | H | + | + | + | + | + | + | + | + |
| Puyallup River | 146 | H | + | + | + | + | | + | + | + |
| Voight Creek | 149 | H | + | + | + | + | | + | | + |
| Carbon River | 152 | H | + | + | + | + | | + | + | + |
| Wilkeson Creek | 154 | H | + | + | + | + | | + | | + |
| South Prairie Creek | 156 | H | + | + | + | + | | + | | + |
| White River | 159 | H | + | + | + | + | | + | | + |
| Green River | 170 | H | + | + | | + | | + | + | + |
| Cedar River | 176 | H | + | + | | | + | + | + | + |
| Raging River | 185 | H | + | + | + | + | | + | + | + |
| Snoqualmie River | 197, 202 | H | + | + | + | + | | + | + | + |

Sources: Aultfather 1978; Fisher 1978; Lowery 1978; VanWormer 1978; Washington Department of Fisheries 1975; Zscholmer 1978

1/ Pipeline mile where stream crossing would occur.

2/ Overall value of fishery including all species. Value based on the following considerations: fish population size, habitat quality, angler preference, access, availability, commercial importance, state and federal stocking, local and regional importance, etc.

H = High Value M = Moderate Value + = Species present but not evaluated.

distribution and quantity of sediment downstream from the crossing would include bottom composition, water velocities, streambed slope, and excavation methods.

Most of the sediment would be deposited within a few hundred feet of the crossing area with the smaller particles traveling farther downstream. Impacts should last 1 year or less since most of the sediment would probably be flushed out during the first period of high flows. This flushing action would be greater in streams with high flood flow velocities and high gradients. Sediment would continue to impact fish and insect populations as it moved downstream but the impacts would probably decrease because of sediment dispersal.

Specific concentrations of aquatic insect production have not been identified, but their occurrence is likely immediately downstream from some crossings. These populations would be impacted by the sediments from streambank erosion and by those generated during instream trenching. Sediment related impacts on insect populations are well documented. Sediment would reduce insect populations by: scouring the streambottom and dislodging insects, covering the streambottom and smothering the larvae and eggs, clogging the gills and suffocating the larvae, and preventing larvae from attaching themselves to rocks. The most important insects impacted would be mayflies, caddisflies and stoneflies. Under the worst-case situation the entire production of these insects might be completely eliminated for several hundred feet downstream from the crossing for 1 year and reduced considerably for several years after construction if bank erosion and or stream scouring occurred. These insects serve as the most important food source for juvenile salmon and juvenile and adult trout. A reduction in the supply of these insects might retard fish growth and reduce survival. The juvenile salmon in western Washington streams that feed mainly on these insects before migrating to the sea, would be most affected. However, the impact would probably not be noticed since only small, local populations of fish would be affected and the reduced growth and survival rates would probably be within the normal range.

Sediment desposition in spawning areas would have the most serious impacts. Sediment would settle in spawning gravels and fill in spaces, blocking water circulation to eggs deposited in the gravel. Sediment would also filter through the gravel and cover incubating eggs. Decreases in water circulation incubating eggs can cause mortality by suffocation through a reduced oxygen supply, and by preventing toxic respiratory by-products of the developing eggs from being washed away. Sediment deposition can also prevent newly hatched fry from emerging from the gravel and lead to poor quality and reduced survival of fry that do emerge. Deposition of sediment before spawning would have impacts similar to those previously described, since sediment is redistributed during the spawning process. If sedimentation were severe, 100 percent mortality could occur within the impacted area, which would generally extend several hundred feet downstream from the crossing. Most of the sediment would probably be flushed out of the gravel during the first period of high flows, with the remainder of the sediment moving downstream in subsequent years. Sediment would tend to settle in areas of low water velocities such as pools, lakes, and estuarine areas.

Sediment which remained in the gravel for one year or less would only impact one year-class of fish. Since the different species of salmon and trout spawn at different times of the year and eggs can be found in the gravel during nearly all months of the year in most streams, it would be possible to impact all species within a stream. If concentrated spawning areas were severely impacted by sediment, 100 percent mortality of all fish production within the impacted area (several hundred feet downstream) could occur. Since spawning for particular species normally extends for a considerable distance both upstream and downstream from the crossing area (several miles in some streams), the loss of fish in a relatively short stream segment should not have a critical effect on the population. In streams in which spawning habitat is limited to a few thousand yards or less, the loss of one year-class of fish within the impacted area would be significant and the overall stream population level for a particular species might fall below the normal range. Several spawning cycles might be required for these impacted populations to recover to previous levels. Streams in which this might occur include the Duckabush, Hamma Hamma Rivers and other short streams along Hood Canal. Only under certain circumstances such as a low number of spawning adults, severe sedimentation, and loss of production in other areas of the stream, would the population be reduced substantially. Several cycles of the impacted year-class might be required for the population to return to earlier levels. Since some searun fish return to spawn every year and others every 2, 3, or 4 years, up to 20 years may be required for some poulations to fully recover. It is likely that reductions would be noticed in ocean commercial, sport, and Indian fisheries. However, substantial reductions could all affect river sport, Indian fisheries and other terminal fisheries in estuaries.

Sediment would also fill in pools. Fish using these pools as resting areas would be displaced. Increased competition with displaced fish should not have a significant impact on fish populations. Suspended sediment can clog and irritate the gills of fish and interfere with respiration. Severe conditions might extend downstream for several hundred yards. However, the number of fish expected to suffer mortality would be quite small, since fish would usually avoid such conditions, if at all possible.

The most important impact during the operation phase would result from a leak or pipe rupture. Such an event could occur at any stream crossing. The leak detection system would be capable of sensing a 0.5 percent loss of throughput volume but would allow a leak under this limit to go undetected. A leak of up to 3,540 barrels per day at a throughput of 709,000 barrels per day and up to 4,660 barrels per day with a 933,000 barrels per day throughput could occur and would continue until detected visually and stopped. If oil were to spill, aquatic insect egg, larvae, and adult stages, juvenile, and adult stages could be impacted. An oil spill could impact fishery resources in the following ways: 1) oil may act on the body and gill surfaces of fish and interfere with respiration; 2) oil may coat and destroy algae and other plankton; 3) settling oil substances may coat stream bottoms, destroying bottom organisms and interfering with spawning areas; 4) oil may be ingested by fish and taint the flavor of the flesh; 5) organic materials may deoxygenate waters sufficiently to kill fish; 6) heavy coatings of oil on the surface may interfere with natural reaeration and photosynthesis; and 7) insufficient concentrations, some water soluble fractions may exert a toxic action on fish or fish-food organisms. A fuel oil spill associated with equipment operation would have similar though smaller impacts.

Oil would probably spread downstream for several miles depending on streamflow characteristics and detection and shut-down times. The severity of impacts could range from the complete elimination of all fish and insects for several miles downstream if spill volumes and oil concentrations were high to no detectable impact, if spill volumes and oil concentrations were low. If elimination of a large percentage of fish occurred, several years would be required for the populations to be reestablished. It is probably that prespill population levels would eventually be achieved. Direct impacts would only last for the duration of the spill or until clean water replaced oil-contaminated water.

Large spills could also have major impacts on the salmon fishery resource in western Washington streams, particularly if large concentrations of juvenile salmon were eliminated. Since salmon spawn every 2, 3, or 4 years, depending on the species, the spawning run could be reduced for several years. Pink salmon, which spawn predominately every other year could be noticeably reduced for many years. Very few Washington streams support sockeye salmon and since the Cedar River contains the largest run a reduction of this population could be critical.

Concentrations of juvenile salmon released from hatcheries could also be seriously reduced if they were exposed to an oil spill as they migrate to the sea or as they spend time growing in streams before their migration. Fish released both upstream and downstream from hatcheries could be impacted. Two hatcheries present another problem. The Puyallup and Issaquah salmon hatcheries draw water downstream from the proposed crossing area for use in the hatchery facilities. If oil-contaminated water were allowed to enter these hatcheries, even in low concentrations, the entire production exposed to the oil could be eliminated. This would be a critical impact.

Population reductions to salmon resulting from an oil spill would probably not be noticed in the ocean sport, commercial, or Indian fisheries. However, if impacts were severe, reductions could be noticed in the river sport and Indian fisheries.

Impacts resulting from sedimentaion would also occur during the operation phase, but would decrease as the amount of sediment reaching streams decreased as stream bank vegetation occurred. However, specific unidentified sites could continue to be a source of sediment for many years if revegetaion were not successful. The impacts would be similar to those discussed in the construction phase, but of lesser magnitude. Sites most likely to be a problem are those with steep slopes, unstable soils, and high runoff potential such as the Dosewallips, Duckabush, Green, and Raging Rivers. Some crossings could continue to be problem areas throughout the project life as streambed scouring exposed the pipe. Streams likely to be a problem in this regard are meandering streams and streams with unstable bottoms and high flow velocities such as the Dungeness, Duckabush,and Nisqually Rivers. Scouring would disturb sediment and carry it downstream. Sediments could also be resuspended and redistributed if it became necessary to operate equipment in streams to rebury the exposed pipe. Impacts would be similar to those described in the construction phase, but would be of lesser magnitude, since the disturbance would not be as great.

Fisheries impacts would be greater for the alternative due to the greater number of stream crossings. Impacts for stream crossings are shown in tables 9.4-18 and 9.4-19.

## Marine Resources

### Physical Components

The inland waters discussed in conjunction with the pipeline system are the Puget Sound Basin south of Admiralty Inlet and Hood Canal. The main basin of Puget Sound

## TABLE 9.4-18 SUMMARY OF IMPACTS ON FISHERY RESOURCES IN WESTERN WASHINGTON STREAMS[1]

|  | Construction |  |  |  | Operation |  |  | Abandonment |
|---|---|---|---|---|---|---|---|---|
|  | Sediment Impacts |  |  |  | Oil Spill Impacts |  |  | Sediment Impacts |
| Stream | Pipeline Mile | Significant Spawning Habitat[2] | Streambed Sediment[3] | Streambank Erosion[3] | Hatchery Operations[4] | Indian Fisheries[5] | Juvenile Fish Populations[6] | Streambank Erosion[7] |
| Dungeness River | 10 | Yes | Low | Moderate | Moderate. Loss of exposed juveniles released upstream and downstream. | Disrupted and reduced catches | High | Low |
| Little Quilcene River | 34 | Yes | High | Low | -- | Disrupted and reduced catches | High | Low |
| Big Quilcene River | 35 | Yes | Moderate | Low | Moderate. Loss of exposed juveniles released upstream | Disrupted and reduced catches | High | Low |
| Dosewallips River | 44 | Yes | Moderate | High | -- | Disrupted and reduced catches | High | Low |
| Duckabush River | 48 | Yes | Moderate | High | -- | Disrupted and reduced catches | High | Low |
| Hamma Hamma River | 57 | Yes | Moderate | Moderate | -- | Disrupted and reduced catches | High | Low |
| Finch Creek | 68 | No | -- | -- | High. Contamination of hatchery downstream. | -- | High | Low |
| Skokomish River | 76 | Yes | Low | Moderate | Moderate. Loss of exposed juveniles released downstream. | Disrupted and reduced catches | High | Low |
| Deschutes River | 114 | Yes | Moderate | Moderate | Moderate. Disruption of egg taking operation at fish facility. | -- | High | Low |
| Nisqually River | 128 | Yes | Low | Moderate | -- | Disrupted and reduced catches | High | Low |
| Puyallup River | 146 | Yes | Low | Low | -- | Disrupted and reduced catches | High | Low |
| Voight Creek | 149 | No | Moderate | Low | High. Contamination of hatchery downstream | -- | Low | Low |
| Carbon River | 152 | Yes | Low | Moderate | -- | -- | High | Low |
| South Prairie Creek | 156 | Yes | Moderate | Low | -- | -- | High | Low |
| White River | 159 | Resident trout only | Low | Moderate | -- | Disrupted and reduced catches | Moderate | Low |
| Green River | 170 | Yes | Low | High | Moderate. Loss of exposed juveniles released upstream | Disrupted and reduced catches | High | Low |
| Cedar River | 176 | Yes | Moderate | Moderate | -- | Disrupted and reduced catches | High | Low |
| Issaquah Creek (carey and Holder Creeks) | 178<br>179 | No<br>No | --<br>-- | --<br>-- | High. Contamination of hatchery downstream | --<br>-- | Low<br>Low | Low<br>Low |
| Raging River | 185 | Yes | High | High | -- | -- | High | Low |
| Snoqualmie River | 197,202 | Resident trout only | Moderate | High | -- | -- | High | Low |

[1] Refer to table 2.1-65 for more detailed information concerning spawning habitat, hatcheries, and Indian fisheries.
[2] Presence of significant spawning habitat for salmon and trout in crossing area.
[3] Estimated impact on salmon and trout populations produced in area immediately downstream from crossing. Based partly on information submitted by Fugro (1978) and Roger Low Assoc., Inc. (1978). Assumes actual spawning habitat is present and utilized substantially. High = Reduction would be below normal range of fluxuations. Moderate = Reduction would be near the low range of fluxuations. Low = Reduction would be within normal range of fluxuations
[4] Estimated impact on fish populations associated with appropriate hatchery. Assumes large number of fish exposed to oil. Delay of migrating spawners could occur in all streams and could lead to decreased production.
[5] Estimated impact on Indian River fisheries. Disruption of fishing activities would occur during and immediately after an oil spill. Reduced catches would occur on subsequent spawning runs and during the current run if adult mortalities occur.
[6] Estimated loss of naturally produced salmon and trout (non-hatchery fish). Based on length of stream, number of fish likely to be exposed to oil, and significant habitat downstream. Impact would vary depending on season when spill occurred.
[7] Disturbance to streambanks and resulting erosion is expected to be minimal to low in all cases.

TABLE 9.4-19 SUMMARY OF IMPORTANT IMPACTS TO SALMON AND TROUT IN WESTERN WASHINGTON

| IMPACT | CONSTRUCTION | | | OPERATION | | | ABANDONMENT | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | Intensity | Duration | Magnitude | Intensity | Duration | Magnitude | Intensity | Duration | Magnitude | |
| SEDIMENT | Moderate at most stream crossings. Siltation from in-stream trench excavation. | 1 year or less. Generally until high flows flush sediment from gravel. | Several hundred feet downstream from crossing. | Moderate at stream crossings. Sediment influxes would occur during run-off from streambank erosion. | For the project life but decreasing at most crossings throughout project life. | Several hundred feet downstream from crossing. | Low at most stream crossings. Siltation from stream bank erosion Assumes pipe would remain in place under streams and minimal streambank disturbances would occur. | 1 year or less. Generally until high flows flush sediment from gravel. | Several hundred feet downstream from crossing. | Siltation of spawning areas would reduce fish production if sediment is in gravel when spawning occurs or is deposited while eggs are incubating. Worst-case would eliminate all fish production for several hundred feet downstream from crossing for 1 year. Siltation would also reduce insect production. Fish losses would not generally be noticed except possibly in certain river fisheries in severe cases. Siltation would result from streambank erosion as vegetation is removed and soil disturbances occur and as instream trenching occurs during the construction phase. Siltation would decrease at most stream crossings throughout project life as revegetation occurs. Siltation would also occur during the abandonment phase if soil is disturbed. Some populations may remain suppressed after abandonment. |
| | FUEL OIL SPILL | | | PIPELINE RUPTURE | | | FUEL OIL SPILL | | | |
| OIL SPILL | Low in most cases because of small volumes. | Duration of the spill in streams. | Several miles downstream from spill. | Moderate to high in most streams. | Impact would be for the duration of the spill. Several week residual impact in some streams. | Several miles downstream from spill. | Low in most cases because of small volumes. | Duration of the spill in streams. | Several miles downstream from spill. | Oil spills would reduce fish populations in all areas where high concentrations of oil occur. Worst-case could eliminate all fish which are exposed to oil. Fish would avoid oil concentrations where possible. Fish populations exposed to oil over a longer period of time would suffer higher mortalities. Oil-contaminated water could enter the Puyallup, and Issaquah salmon hatcheries downstream from the crossing area. All production in these facilities at the time of exposure could be lost. Full recovery of fish populations would occur after several spawning cycles. Fuel oil spills could occur during construction and abandonment phases from equipment operation. Pipeline rupture could occur during operation. |

runs 113 miles from the southern tip of Whidbey Island to Tacoma. Depths average 590 to 786 feet in this section but can occasionally be deeper. The southern Sound has numerous branching channels, inlets, and islands, The Nisqually River is the largest source of freshwater in the southern Puget Sound.

Hood Canal, averaging less than 2.5 miles in width and 590 feet in depth extends about 47 miles south-southeast from Admiralty Inlet and then turns more than 90 degrees to the east and continues another 14 miles. Dabob Bay branches off to the north from the middle of the canal and is approximately 11 miles long.

The movement of water within the Puget Sound-Hood Canal system consists of a three layer system similar to that in the Strait of Juan de Fuca. Tidal currents cause the back and forth oscillations of the water masses in addition to the energy required for both horizontal and vertical mixing. The presence of sills at the entrance of Hood Canal and in the southern Puget Sound Basin impedes the flow of deep water into these areas. This impeded flow increases the time required to replace or flush the water in these systems. The canal flushes slowly in part because of its tremendous length relative to its width. The mean replacement time is about 177 days (Vagner and Mar 1972).

Hood Canal, lacking industrialization, has a marine water classification of extraordinary or class AA. Water bodies in the South Puget Sound have various classifications. Oakland Bay, Totten Inlet, Budd Inlet, Eld Inlet, Pickering Passage, Peale Passage, Skookum Inlet, and Hammersley Inlet are classified as excellent or class A. This is principally because of inputs from forest industries and low tidal flushing (McGary and Linclon 1977). Waters in Budd Inlet, south of Priest Point Park, are classified good or B. All other inlets and bays in the South Puget Sound area are classified extraordinary or class AA, except Commencement Bay where waters are both excellent or A and good or B. Location of the various water classes can be found in the Map Addendum.

During construction along the western perimeter of Hood Canal and around South Puget Sound, no impacts can be expected on water quality.

A rupture in the pipeline at one of the stream crossings would significantly impact the water quality in Hood Canal or South Puget Sound since a large volume of oil could be transported from the aquatic environment to the marine environment. The estimated, existing pipeline risk in Greater Puget Sound, for a spill equal to or greater than 2.4 barrels, is one spill every 1.19 years. The estimated frequency of pipeline spill magnitudes for 198 statute miles of onshore pipeline from Port Angeles to North Bend around the Sound is given in table 9.4-20. An oil spill, equal to or greater than 2.4 barrels, for the alternative pipeline route would be one spill every 2.5 years. The combined risk is therefore estimated to be one spill, equal to or greater than 2.4 barrels, every 0.81 years. The impact of an oil spill upon water quality in Hood Canal or Puget Sound would be significant. Estimated mean flushing times are 177 days for Hood Canal and 56 days for Southern Puget Sound (Friebertshauser and Duxberry 1972).

Expressions of probability are useful indicators of future events, but caution must be taken to avoid misinterpretation of these estimated values. "One spill every 'X' years" expresses a calculated rate and does not indicate when the spill may occur. Also, the estimate will remain valid only if conditions do not deviate significantly from historical patterns.

TABLE 9.4-20 ESTIMATED FREQUENCY OF PIPELINE SPILL MAGNITUDES FOR 198 ONSHORE PIPELINE MILES FROM PORT ANGELES TO NORTH BEND
(Spills ≥ 2.4 Barrels)

| Spill Magnitude (in barrels) | Spill Frequency and Uncertainty 1/ (years per spill) |
|---|---|
| | Port Angeles 709,000 bbls/day and 933,000 bbls/day |
| | One spill every: |
| 2.4 - 10 | 6.7 years (3.3, - ) |
| 10.1 - 100 | 5.3 years (2.6, - ) |
| 101 - 1,000 | 20 years (10.0, - ) |
| 1,001 - 10,000 | 100 years (50, - ) |
| 10,001 - 100,000 | 1,000 years (333, - ) |
| A Spill ≥ 2.4 | 2.5 years (1.2, - ) |

Source: OIW 1978

1/ The ranges shown in parentheses are estimates of the 95 percent confidence limits based on the derived historical pipeline spill rates, and were calculated by assuming that the variance of each spill magnitude category was equal to the variance of the dta for all pipeline spills. Upper limits are unpredictable and indicated by a dash.

### Biological Components

Marine areas that might be affected by the pipeline are Hood Canal and South Puget Sound. These two areas support important commercial Pacific oyster and Olympia oyster fisheries and are suitable for oyster culture and oyster spawning. Commercial and sport bottomfish, salmon, shellfish, crab, and shrimp fisheries are also important in the areas (Washington State Department of Fisheries 1973a, 1973b, 1976; Washington State Department of Natural Resources 1977) (Washington Department of Natural Resources, 1977; Squire, Jr. and Smith, 1977). The distribution of bottomfish and salmon are those areas fished, indicating the areas where fish are concentrated.

Many marine fowl rest, feed, nest, and winter in numerous locations in south Puget Sound Basin. These waterfowl consist of plunge divers, divers, diving ducks, dabbling ducks, geese, and shorebirds. A particularly important waterfowl habitat is found on the Nisqually Flats.

Numerous mammal species are found in the inland waters of the Puget Sound Basin, south of Admiralty Inlet, and Hood Canal. These mammals are predominately harbor seals, porpoises, and river otters.

### Threatened and Endangered Species

Two endangered marine mammals, the gray whale and humpback whale, have been sighted in Puget Sound (Everit, Fiscus, DeLong 1979). The location of these sightings are shown in the Map Addendum. These whales are not common to the Puget Sound area;

hence, they should be considered strays from their usual outer coast migratory routes. No threatened and endangered marine birds are found within the southern Puget Sound Basin. Bald eagle sites can be found throughout the basin, but these birds are terrestrial species which frequently visit marine habitats.

No impacts to the marine resources in Hood Canal or south Puget Sound are anticipated due to construction of pipeline river crossings.

Pipeline ruptures on the Duckabush River or Skokomish River would impact harbor seal haul-out areas and river otter habitats in Hood Canal. A rupture on the Quilcene river would degrade water quality in Dabob Bay and could severly impact the Pacific oyster culture. Any pipeline rupture in a stream entering Hood Canal would result in tainting and sublethal effects in geoducks, butterclams, intertidal hardshell clams, shrimp, and crabs. Sports and commercial fisheries could also be affected. A major waterfowl area and harbor seal haul-out area at the Great Bend could be impacted causing high waterfowl mortality and/or low egg hatchabiity. Herring spawning grounds are located near the Duckabush River. If these grounds were impacted by oil during a spawning run, a year-class could be lost. This could have an indirect impact upon those fishes that feed upon herring.

An oil spill on the Nisqually River in South Puget Sound could impact the marine resources in the Nisqually Reach. These resources are intertidal clams, crabs, and shrimp. Also, Nisqually Flat is a major waterfowl area and river otter habitat.

### Terrestrial Vegetation

The Olympic Peninsula, including Green Point and the pipeline corridor to pipeline mile 75, is within the cedar-hemlock/Douglas-fir ecoregion. This forest land is one of the finest coniferous forests in the world; dominant species attain their maximum development (Franklin and Dyrness 1973). The corridor through the Olympic foothills includes a mixed conifer-deciduous forest interspersed with pastureland. Douglas-fir, western red cedar, and red alder, salmonberry, salal and juneberry occur in most areas including the BPA power-line corridor. Although this area has the most dense forest cover, most of these forests have been logged over so the stands are young.

The Willamette-Puget Forest ecoregion (pipeline mile 76 to 150) includes the Puget Trough physiographic province and has special plant communities. These communities include prairie vegetation and stands of lodgepole pine, western white pine, and ponderosa pine (Franklin and Dyrness 1973). Their presence reflects the different glacial history, climate, and soils of the area as compared to surrounding mountainous terrain.

In the western portion of this ecoregion lodgepole pine and Douglas-fir are major overstory components. Red alder, salal and big-leaf maple are dominant members of the shrub strata. Most of the remaining forestland is dominated by Douglas-fir, red alder, Oregon white oak, and western red cedar. Most of the forest has been logged.

The Mima, Weir, and Smith prairie habitats and pasture lands are also found in this ecoregion.

A major impact on natural vegetation from pipeline construction and normal operation would occur in the forested ecoregions, tables 9.4-21 and 9.4-22, which include the Olympic, and Cascade Ranges in western Washington. These conifer dominated plant communities would lose, for the life of the project, their overstory components. Estimates of acres of forest land cleared for construction for around Puget Sound segment of the pipeline are shown on table 9.4-21. These estimates are based on measurements made from photomosaics of the proposed route and assumptions that a 75-foot right-of-way would be permanently maintained in all cases.

TABLE 9.4-21 ACRES OF NATURAL VEGETATION IMPACTED

| Ecoregion | Pipeline Mile | State County | Construction (acres) Forestland | Maintenance (acres) Forestland |
|---|---|---|---|---|
| Cedar/Hemlock/ Douglas-fir Forest | | WASHINGTON | | |
| | 0-22 | Clallam | 203 | 169 |
| | 22-52 | Jefferson | 174 | 145 |
| | 52-75 | Mason | 115 | 96 |
| Willamette/ Puget Forest | 75-92 | Mason | 133 | 117 |
| | 92-128 | Thurston | 229 | 203 |
| | 128-159 | Pierce | 186 | 167 |
| | 159-180 | King | 107 | 96 |
| Silver fir/ Douglas-fir Forest | 180-213 | King | 261 | 248 |

TABLE 9.4-22 PIPELINE SYSTEM, VEGETATION IMPACTS

| Ecoregion | Stratum | Construction | | Operation-Maintenance | | | |
|---|---|---|---|---|---|---|---|
| | | | | Normal | | Abnormal | |
| | | Short 1/ | Long 2/ | Short | Long | Short | Long |
| Cedar Hemlock Douglas-fir Forest | Overstory | -H3/ | L | L | 0 | -L | -L |
| | Understory | -M | +L | 0 | +L | -M | 1 |
| Willamette Puget Forest | Overstory | M | -L | -L | 0 | -L | -L |
| | Understory | -M | +L | 0 | +L | -M | -L |
| Silver-fir Douglas-fir | Overstory | -H | -L | -L | -L | -L | -L |
| | Understory | H | +L | 0 | +L | -M | -L |

1/ Short-term = less than 1 year.
2/ Long-term = more than 1 year.
3/ + or - = nature of impact, negative or positive.
H = substantial or "significant" impact; M = moderate or almost "significant" impact; L - low or minor impact.

Forest land adjacent to the maintained corridor should not be significantly damaged by vegetation maintenance operations primarily because the applicant (NTPC) will not use aerial spraying of herbicides (Northern Tier Pipeline Company 1978).

The quantity of timber production which would be lost during the life of the project can not be estimated at this time because of insufficient information.

Associated with this loss of dominant overstory vegetation would be an expected increase in shrubs, grasses, and sedges, within the first year following construction. The species diversity of the pipeline right-of-way would increase, in that less shade-tolerant plants would have more suitable habitat.

These less shade-tolerant plants, predominately forbs and shrubs, are characteristic of early successional stages of plant community development. These plants, which could include juneberry, blackberry, and legumes, would not occur or would be less abundant in tHe more advanced successional plant community dominated by trees.

Other potential impacts on vegetation could occur at the crossings of the Hamma Hamma and Skokomish River Valleys where tidal and freshwater wetlands exist in the lowlands near Hood Canal.

The specific types of impacts on terrestrial vegetation resulting from oil contamination have been discussed in several publications (Baker 1971b, 1971c; Hutchinson and Freedman 1975; Schwille 1967; and others). The extent of impact resulting from a spill would primarily depend on the time of year and spill size.

### Threatened and Endangered Species

Although several threatened and endangered species probably inhabit the project right-of-way, no unique habitats are known to be within the corridor.

### Terrestrial Wildlife

Northern bald eagles are classified as threatened in the state of Washington. Active northern bald eagle nests, as well as inactive nests and wintering populations are identified in table 9.4-23.

Areas of special concern along the around Puget Sound segment of the pipeline are listed on table 9.4-24.

Impacts on wildlife from pipeline construction could include the following:

Abandonment of current breeding sites influenced by sensitivity to disturbance activities;

Removal of breeding adults from the general population through disturbance and alteration of normal feeding and reproductive behavior;

U.S. Forest Service

TABLE 9.4-23 LOCATION OF BALD EAGLES

| | | | | Habitat Descriptions and Observations | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Nest Sites | | Wintering Sites | | | | |
| Species | Total Numbers | Location | Pipeline Mile | Active[1/] | Inactive[2/] | Resident[3/] | Occasional[4/] | Season of Occurrence | Sightings and Activities | Sources |
| Bald Eagles | 4 | Washington Green Point | 0 | | x | x | | Winter | No nests identified. Two mature eagles sighted at proposed tank farm site. One mature and one immature eagle sighted along bluff near proposed tank farm site. Possible winter roosting habitat on Green Point. | ERT 1978 |
| Bald Eagles | Unknown | Dabob Bay | 34 | x | | x | | Winter and resident year-round | One nest 2 miles east of proposed pipeline was active in 1975. Eagles observed along southwest side of Bay and in general area during winter. | Washington Department of Game 1978 |
| Bald Eagles | Unknown | Quilcene Bay | 35 | | x | | x | Winter | Inactive nest in 1975. Observation of eagles along southwest side of Bay and in general area during winter. | U.S. Forest Service 1978 |
| Bald Eagles | 12 | Hamma Hamma River | 56 | | x | x | | Winter | Inactive nest in 1975. 10 eagles near river mouth sighted in one observation. Eagles frequently observed along this migration route from early fall through early winter. | Washington Department of Game 1978 |
| Bald Eagles | Unknown | Lilliwaup Bay | 64 | | x [5/] | | x | Not identified | Nest identified 2 miles south of Bay. Actual use not determined. | Washington Department of Game 1978 |
| Bald Eagles | 2-3 | Nisqually Delta | 127 | x | | x | | Winter and resident year-round | One eaglet produced in 1975 in nest 8 miles north of proposed route. Nest was inactive in 1976 and 1977. Total of 153 eagle observations from 1973-1977 in general area during late winter. | Washington Department of Game 1978 |
| Bald Eagles | 1 | White River | 158 | | x | | x | Unknown | No nests located. Good potential nesting and wintering area. | U.S. Forest Service 1978 |

Increased observation and predation of nest sites and adults and feeding areas;

Potential reduction of prey species and other food sources by alteration of habitats; and

Potential decrease of productivity caused by timing and duration of construction.

TABLE 9.4-24 AREAS OF SPECIAL CONCERN

| AREAS/STATE | WILDLIFE | PIPELINE MILES |
|---|---|---|
| WASHINGTON | | |
| Isabella Lake | Waterfowl concentrations downstream from Gosnell Creek crossing | 85 |
| Nisqually River | Winter waterfowl concentrations, important pheasant habitat and great blue heron | 128 |
| Puyallup River | Winter waterfowl concentrations | 144 |

Disturbance along the pipeline segment would affect both wintering and nesting northern bald eagles. Impacts to bald eagles would be the same as those discussed for wildlife on the pipeline in chapter 3.

Two active eagle nest sites could be impacted along the pipeline segment. The Nisqually River Delta nest site is approximately 8 miles north of the pipeline route. Eagles here could be impacted indirectly by an oil spill along the Nisqually River causing oil contamination of food items. Direct impacts from construction disturbances would be unlikely, but feeding habits could be disrupted. The nest near Dabob Bay is approximately 2 miles from the proposed route. Eagles here may abandon the nest site during construction activities. Bald eagle nesting along the pipeline segment have previously been indicated. Impacts on these eagles are described in table 9.4-25.

No pergrine falcon nests have been located in the corridor of the pipeline segment.

Impacts on other species of wildlife in areas of special concern are shown in table 9.4-26.

## Cultural Resources

The cultural resources sites listed below would potentially be affected if this route segment alternative is used. There is high potential for discovery of additional archaeological and historic sites along the proposed corridor, especially at crossings of stream valleys.

The currently known sites are shown in tables 9.4-27, 9.4-28, and 9.4-29.

Potential impacts to these sites and to any presently unrecorded sites would be the same as those discussed in chapter 3.

## Visual Resources

As this alternate route traverses around Puget Sound, the terrain is low, rolling foothills. The vegetation is coniferous cover. The northern foothills and shoreland are open farm and pastureland. Along Hood Canal, dense conifer forests have some deciduous trees in the drainages.

Many farms, homes, and rural developments are in the foregroung-middleground visual zone of the proposed corridor. They include the towns of Carlsborg, Sequim, Quilcene, Shelton, and developments around Lake Isabella, Summit Lake, and Black Lake plus several smaller communities. Much of this segment is also in the foreground-middleground visual zone of the U.S. Highway 101, a designated scenic highway, and of Sequim Bay and Dosewallips State Barks, the Skokomish Indian Reservation, and the Naval Auxillary Air Station in Shelton. It is in the middleground-background visual zone and visible from view-points enroute to Olympic National Park.

Overall, the portion of the route from Green Point to Black Lake has both high scenic quality (A/B) and visual sensitivity. It is in the visual managment quality class II (USFS Retention).

The portion of the route extending from Black Lake to North Bend, has a C scenic quality rating; visual management quality class III (USFS Partial Retention). Landform in the Puget Lowlands is level to rolling timberland. Vegetation is dense to scattered coniferous cover with some deciduous trees and understory in the open areas and drainages.

There are some scattered rural residential areas and open farmlands throughout the segment. Water features crossed by the proposed route include the Deschutes, Nisqually, Puyallup, Carbon, and White Rivers, along with several small streams and drainages. Man-made intrusions include high-voltage transmission lines cut through forest lands and many cleared blocks of timberland interspersed along the route. Because of these intrusions and the large open tracts of farmland and sparse population, this segment has a moderate to low sensitivity rating.

Analysis of the visual impacts of construction of the pipeline system assumed that:

Pump stations would be located on sites with a grade of 5 percent or less.

The proposed right-of-way would stay within the existing BPA corridor wherever possible.

The clearcut width of the BPA right-of-way corridor is over 600 feet in some areas and expansion is anticipated for upgrading and/or adding of new powerlines.

TABLE 9.4-25 SUMMARY OF IMPACTS ON BALD EAGLES

| Area | State | Pipeline Mile | Nesting Sites |  | Wintering Sites |  | Impacts |
|---|---|---|---|---|---|---|---|
|  |  |  | Active[1/] | Inactive[2/] | Resident[3/] | Occasional[4/] |  |
| Green Point | WA | 0 | X |  | X |  | Removal of winter and nesting habitat by destruction of roosts and disturbance of feeding areas. |
| Dabob Bay | WA | 34 | X |  | X |  | Eagles may abandon an active nest due to disturbance. |
| Quilcene Bay | WA | 35 |  | X |  | X | Intermittent use of an existing nest may be abandoned. Increased disturbance may displace wintering eagles and alter feeding and roosting habits. |
| Hamma Hamma River | WA | 56 |  | X | X |  | Intermittent use of an existing nest may be abandoned. Increased disturbance may displace wintering eagles and alter feeding and roosting habits. |
| Lilliwaup Bay | WA | 64 |  | X[5/] |  | X | Intermittent use of an existing nest may be abandoned. Increased disturbance may displace wintering eagles and alter feeding and roosting habits. |
| Nisqually Delta | WA | 127 | X |  | X |  | Eagles may abandon an active nest due to disturbance. Increased disturbance may displace wintering eagles and alter feeding and roosting habits. |
| White River | WA | 158 |  | X |  | X | Potential nesting habitat may be abandoned and breeding eagles displaced to areas of less disturbance. |

Sources: U.S. Fish and Wildlife Service; Washington Department of Game

[1/] Nest occupied and young may be produced.

[2/] No known nests near corridor; potential nest sites available; observations of eagles in general area.

[3/] Frequent observations of eagle populations from September through February.

[4/] Occasional observations during winter; occurrence of resident populations unknown.

[5/] Existing nest; production and occupancy unknown.

TABLE 9.4-26 POTENTIAL IMPACTS ON WILDLIFE IN AREAS OF SPECIAL CONCERN

| | | | IMPACTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Construction | | Operation | | | | Abandonment | | |
| | | | | | Normal | | Worst-Case | | | | |
| Area | State | Pipeline Mile | Long-Term | Short-Term | Long-Term | Short-Term | Long-Term | Short-Term | Long-Term | Short-Term | Wildlife Impacts |
| Isabella Lake | WA | 85 | 0 | -L | 0 | -L | 0 | -M | 0 | -L | Waterfowl concentrations include approximately 49 birds per mile which disturbance or an oil spill could impact. |
| Nisqually River | WA | 128 | 0 | -L | 0 | -L | 0 | -M | 0 | -L | Summer months over 538 waterfowl while winter months reach 4,842 birds which could be impacted by disturbance and/or an oil spill on the Nisqually River. |
| | | | -M | -M | -L | -L | 0 | -L | 0 | -M | Construction could destroy all or part of a great blue heron rookery used by 12 to 15 pairs and disturbance could reduce production. |
| Puyallup River | WA | 144 | 0 | -L | 0 | -L | 0 | -L | 0 | -L | Winter concentrations of waterfowl could be impacted by an oil spill. |

Sources: Washington Department of Game pers. comm. 1978; U.S. Fish and Wildlife Service

Note: Construction, Operation, and Abandonment--assumes activities would occur during most sensitive period for the species impacted within the time frames.
Normal Operation: assumes right-of-way maintenance would occur every 5 years. Worst-Case Operation: assumes a maximum oil spill event would occur. Abandonment: assumes pipe would be removed. Long-Term: lasting more than 1 year or affecting more than one generation. Short-term: lasting less than 1 year or affecting only one generation. Significant Impacts: rated in magnitude as 0 (none), L (low), M (moderate), or H (high), and as + (beneficial) or - (adverse).

Waterfowl concentration U.S. Fish and Wildlife Service

## TABLE 9.4-27 PREHISTORIC ARCHAEOLOGICAL SITES ALONG THE NORTHERN TIER AROUND PUGET SOUND SEGMENT PIPELINE CORRIDOR

| County, State | Site Number | Site Name | National Register | Site Type | Location By Pipeline Mile | Within 2-Mile Study Corridor | Outside Study Corridor |
|---|---|---|---|---|---|---|---|
| Clallam, WA | 45CA218 | Manis Mastodon Site | Yes | Mastodon kill site and butchering station - possible camp site | 11 | X | |
| Jefferson, WA | -- | Seal Rock Shell Mounds (Bis-wa'div) | Yes | Habitation - possible potlatch site | 42 | X | |
| Mason, WA | 45MS50 | -- | No | Shell midden | 72 | | X |
| Mason, WA | 45MS51 | -- | No | Shell midden | 72 | | X |
| Mason, WA | 45MS46 | -- | No | Shell midden | 92 | X | |

## TABLE 9.4-28 HISTORIC SITES ALONG THE PROPOSED NORTHERN TIER PIPELINE CORRIDOR

| County, State | Site Number | Site Name | National Register | Site Type | Location By Pipeline Mile | Within 2-Mile Study Corridor | Outside Study Corridor |
|---|---|---|---|---|---|---|---|
| Clallam, WA | -- | Fairview Schoolhouse | No | Early 20th century rural school | 1 | X | |
| Jefferson, WA | -- | Twana winter village site | No | Native American | 35 | X | |
| Jefferson, WA | -- | Quilcene-Quinalt Battleground Site | Recommended | 19th century Native American | 36 | X | |
| Jefferson, WA | -- | Twana summer campsite | No | Native American | 39 | X | |
| Jefferson, WA | -- | CB&M Logging Camp | No | Historic Logging | 40 | X | |
| Jefferson, WA | -- | Twana seasonal fishing campsite | No | Native American | 40 | X | |
| Jefferson, WA | -- | Twana winter village site | No | Native American | 44 | X | |
| Jefferson, WA | -- | Brinnon Townsite | No | 19th century settlement, agriculture and logging | 44 | X | |
| Jefferson, WA | -- | Twana winter village site | No | Native American | 47.5 | X | |
| Jefferson, WA | -- | Twana campsite | No | Native American | 51 | X | |
| Mason, WA | -- | Twana campsite | No | Native American | 54 | X | |
| Mason, WA | -- | Twana campsite | No | Native American | 56 | X | |
| Mason, WA | -- | Twana summer and fall fishing campsite | No | Native American | 57 | X | |
| Mason, WA | -- | Twana summer and fall fishing campsite | No | Native American | 64 | X | |
| Mason, WA | -- | Twana fishing and winter village site | No | Native American | 70 | X | |
| Mason, WA | -- | Potlatch Townsite | No | 19th century settlement | 71 | | X |
| Mason, WA | -- | Twana trails connecting villages and fishing sites | No | Native American | 70,71, and 73 | X | |
| Mason, WA | -- | Twana fishing and campsite | No | Native American | 75.5 | X | |
| Mason, WA | -- | Twana fishing site | No | Native American | 76 | X | |
| Mason, WA | -- | Twana campsite | No | Native American | 76 | X | |
| Mason, WA | -- | Numerous Twana villages and campsites on both sides of Hood Canal | No | Native American | 47-75 | | X |
| Thurston, WA | -- | Offult Homestead | No | 19th century settlement | 113 | X | |
| Thurston, WA | -- | Fort Miller | No | Mid-19th century military fort | 118 Vicinity | Probably | |
| Pierce, WA | -- | Naches Pass Trail | Recommended | Native American emigrant, military and commercial trail, and wagon road | 158 Vicinity | X | |
| King, WA | -- | Green River Gorge Historic District | No | 19th century commercial, industrial and social history | 168-171 | X | |
| King, WA | -- | Bayne Townsite | No | 19th century settlement | 169 | X | |
| King, WA | -- | Georgetown-Selleck road | No | 19th century transportation and settlement | 174 | X | |
| King, WA | -- | Cabin and coal tunnel | No | 19th century mining and settlement | 180 | X | |
| King, WA | -- | Cabin and coal tunnel | No | 19th century mining and settlement | 183 | X | |
| King, WA | -- | 2 cabins -- 4 coal mines | No | 19th century mining and settlement | 187 | X | |
| King, WA | -- | Forts Alden, Patterson Smalley and Tilton | No | Mid-19th century military forts | 188 Vicinity | Possible | |
| King, WA | -- | Cedar Lake Road | No | 19th century transportation and settlement | 197 | X | |

When no unmanageable conflicts between construction and operation of BPA's existing and future facilities exist, BPA will consider joint right-of-way occupancy.

Clearing of a pipeline right-of-way requires removal of existing vegetation and exposure of the soil resulting in a significant visual impact. A swath through dense forest on steep slopes would contrast sharply with a previously undisturbed environment. Even with revegetation there would be moderate color and texture contrast with surrounding forest. Construction of an access road on steep slopes would produce high cut and fill embankments. Revegetation would be difficult, so the contrast of the exposed soil to the adjacent undisturbed vegetation would persist at least for the life of the project. In less scenic or more developed areas the contrast would be less noticeable.

TABLE 9.4-29 PALEONTOLOGICAL RESOURCES ALONG THE NTPC AROUND PUGET SOUND ALTERNATIVE

| County and State | Formation | Age | Type of Locality or Type of Sediment With Potential for Containing Fossils | Location by Pipeline Mile | Within or Crossed by 2-Mile Wide Study Corridor |
|---|---|---|---|---|---|
| Clallam, WA | Twin River | Oligocene-iocene | Marine sedimentary rocks | 0-15 | x |
| Clallam, WA | Twin River | Oligocene-Miocene | Fossil locality | 5 | Probably |
| Clallam, WA | Peat Bog | Younger-Quaternary | Mastodon and bison bones with human cultural material | 11 | x |
| Clallam and Jefferson, WA | Twin River | Eocene-Oligocene | Marine sedimentary rocks | 25-35 | x |
| Mason, Thurston, Pierce, and King, WA | Various | Younger-Quaternary | Glacial drift and till, and alluvium | 67-197 with a few minor breaks | x |
| Thurston and Pierce, WA | Skookumchuck | Eocene | Fossil locality | 127 | x |

Sources: Washington Environmental Atlas 1975; U.S. Army Corps of Engineers, Seattle District, Seattle, Washington Washington; Archaeological Research Center; Washington Department of Natural Resources, Olympia, Washington; Geologic Map of Washington, 1961; Washington Department of Natural Resources, Olympia, Washington

Pump Stations

Four pump stations would be located along this route segment alternative of the pipeline. A forested site was chosen for a worst-case discussion of visual impacts.

Landform Modification. A 6 to 7 acre rectangular tract of land would be cleared and leveled. The color and texture of the exposed soil would contrast sharply with the dense coniferous forest setting.

Access Roads. The cuts and fills needed to form the road surface would also expose soil that would contrast in color and texture with the surrounding forest.

The pump stations would be devoid of vegetation and thus have high color and texture contrast with the dense forest cover of the surrounding environment.

The three-dimensional rectangular block cut out of the forest would become more obvious as the observer's angle of incidence increased. It would also create an unnaturally straight-line shadow form, and expose the contrasting color and texture of tree trunks on the uphill side.

The swath cut for the access road would leave a scar that would be observed as a straight linear form, contrasting in color and texture with the adjacent foliage.

Structures. The appearance of a pump station would contrast strongly with the forest setting. The linear form and color of the flattop tanks, square buildings, barbedwire topped chain link fence, and the angular metallic ancillary gear, piping, and fittings would accentuate the contrast.

Support Facilities. Each pump station would require a source of electric power and an electronic receiver for remote control. In mountainous terrain, signal reflector dishes would be needed for microwave transmission; most sites would be on high, prominent points and most would require a road for construction and maintenance. Construction of access roads, powerline rights-of-way, and reflector dish sites through forestland would accentuate the visual intrusion. The high color contrast of the exposed cut and fill embankments for the road and its surface would in most cases exceed the maximum allowable contrast for visual management Class II and would cause severe adverse visual impacts.

In relatively flat, open field, seldom-seen areas, such as farmland, prairie, and grasslands, the contrast of a pump station and its component parts would be high. However, the site would usually be rated Class III in the visual resource management system, because few people would see it.

Major oil spills, breaks, or leaks in the pipeline during the operation phase could cause adverse impacts to visual resources by contaminating widespread areas, especially shorelines, rivers, and tributary streams.

Contaminated water surfaces would adversely impact water color and quality. The resulting kill of fish and vegetation lining the banks and shorelines would be another significant adverse visual impact.

Cleanup operations to entrap, burn, or physically remove contaminated soil, cobble or vegetation would leave the shoreline or streambanks barren. Repair of the leak would require exposure of the subsoil and the pipe, with impacts similar to construction.

Modifications in the natural form, line, color, and texture would persist for at least 2 years, and diminish over the life of the project.

This alternate to the proposed route is in two sections, the first from Green Point to Black Lake, the second from Black Lake to North Bend. The first, in the visual resource management system is judged to be class II - with a scenic quality rating of B, the second is class III - C.

It is assumed the proposed pipeline route would stay within the EPA existing right-of-way wherever possible, however, there are portions of this segment in which the proposed pipeline would occupy its own right-of-way.

As described in the general remarks on construction, the clearing and alteration of the land for maintenance roads and for installation of the pipeline would create contrasts that would be adverse visual impacts in this highly scenic and visually sensitive segment. Construction would impact the view of motorists at the crossing of the pipeline route and U.S. Highway 101, south of the tank farm at Port Discovery and Jackson Cove, and at hillside cuts as seen from Sequim Bay and Hood Canal. At all of these critical observer positions, maximum allowable contrast for visual management quality objective Class II would be exceeded, and visual resources adversely impacted. As the route crossed the highway a clearcut corridor through the timber would be observed by travelers. This would have high visual impact during construction and could remain as a moderate impact beyond the life of the project.

The contrast created by the crossing of the Dungeness, Dosewallips, Duckabush, Hamma Hamma, and Skokomish rivers would exceed the visual management quality objectives during construction, but would not persist. Revegetation of the riparian landscape would soften the construction impacts, hence, the visual management quality objectives would be met. Pump station 2 is assumed to be located in an open cleared area and so should not have any adverse visual impact.

Almost half of the proposed route would parallel other rights-of-way. The pipeline could expand those existing corridors, but would have far less impact than cutting a new swath through dense forestland.

A good portion of the remaining half would traverse forest lands, some agricultural lands, small communities, and subdivisions. The project would cause moderate visual contrast which would persist for the life of the project. For the rest of this segment, contrast would be low, hence the pipeline construction would meet the visual quality objectives and would not constitute an adverse visual impact. However, the swath through dense timber for the new right-of-way would persist for the long term. The crossing of Interstate 5 would be in the foreground visibility zone of users of this scenic highway--an adverse visual impact.

The crossings of the Nisqually, Puyallup, Green, and Cedar rivers would cause moderate to high visual impact during construction. With the revegetation of disturbed banks, the persisting contrast should be moderate to low.

## Land Use

The primary impact of the around Puget Sound pipeline segment and its ancillary facilities on land use would be the conversion of existing uses to the proposed project use for 20 years. Certain land uses including most cultivated crops and forage production can co-exist with the pipeline and associated uses. Other uses such as timber production or intensive uses involving improvements cannot co-exist.

Certain project features preclude other uses. For the pipeline system, those would include pump stations, remote block valves, electric substations and communication sites. Additional land areas would be needed for such purposes as storage yards, borrow pits and, spoil disposal. An unknown amount of land would likely be needed for borrow and spoils disposal during construction. The storage yards averaging about 12 acres each would be located along railroad sidings or other similar open areas. Utility lines, like the pipeline itself, would impact all types of land uses.

### Urban

From Green Point to the intersection with the proposed route the pipeline corridor passes near numerous urban fringe areas. Dominant land uses are agriculture and forest-woodland, however, residential land use commonly occurs in these areas at relatively high densities.

Since the pipeline would be constructed near numerous urban fringe areas, construction would cause nuisance impacts of noise, dust, travel delays, and visual disharmony for brief periods that should not exceed 2 weeks in any one locale (assuming a 1/2 mile per day construction rate).

Pipeline system operation should result in no significant impact to urban lands, in view of the secondary uses that can be made of the right-of-way such as open space, greenbelt areas, recreation buffers or utility corridors.

### Agricultural

Agriculture is a significant land use within the corridor consisting primarily of improved pasture and truck farming, most often located near river floodplains. Individual land holdings are often small, frequently in the range of 5 to 80 acres.

Approximately 400 acres of prime farmland are within the 2,400-acre right-of-way segment. This represents approximately 17 percent of the around Puget Sound right-of-way segment.

Although federal criteria have been established for identification and designation of prime and unique farmlands, mapping has not yet been accomplished. Therefore these data are based only on the soils criteria.

Construction would generally result in the loss of one year's crop on agricultural lands crossed by the around Puget Sound segment of the pipeline. One year's crop loss would generally occur because most of the crops grown within the corridor require a full year's growing season. Construction would take place from April through November progressing at a rate of about one-half mile per day. After construction, the soil disturbance and compaction might lessen productivity for a few years depending upon soil conditions, trenching method, and restoration measures. The losses in agricultural production would not be significant in terms of local (county) agricultural production. Productivity might also be decreased by disturbances of drainage systems. Subsurface drainage systems are particularly sensitive since they are difficult to replace properly once disturbed. There are subsurface drainage systems along the route in Thurston, Pierce, and King Counties.

Normal operation of the pipeline system should have few significant adverse impacts on existing agricultural land uses, except for those areas occupied by block valves from which agricultural use would be displaced. This would not represent a significant amount of agricultural land within any one locale.

An oil spill occurring on agricultural land might ruin a portion of one year's crop and decrease productivity for 1 to 5 years following the spill, if reclamation is effective. The impacts of an oil spill on agricultural land are discussed in the land use section 3.

### Rangeland/Open Space

Rangeland and open space lands are not significant in terms of their extent within the around Puget Sound corridor. Generally such lands consist of flood plains, unimproved and unirrigated pasture, and cleared forest and brush lands.

Pipeline system operation across rangeland and open space should have few impacts except for those areas occupied by block valves. The areas occupied by block valves would be excluded of forage production for the life of the project.

Livestock operations could be adversely impacted as discussed in the land use section of chapter 3. The impacts of an oil spill on rangeland or open space are discussed in the land use section of chapter 3.

### Forest/Woodland

Significant amounts of forest and woodland are within the corridor of this segment of the pipeline. These lands consist of small privately owned woodlots and large corporate-owned and publicly owned forestland. Almost all of the forest land crossed by the corridor in the Puget Sound region is considered commercially productive.

Within the permanent pipeline right-of-way, and at pump stations 1, 2, 3, and 4, timber production would cease for the 20-year life of the project.

In addition, electric transmission lines to serve the pump stations would remove additional forest and woodlands from production. In terms of productive forest land within the affected areas, the impact does not appear to be significant. Forest lands might benefit from cleared rights-of-way serving as fire breaks or fire protection access. Realization of this possible benefit would be highly dependent on the right-of-way location. Conversely, the pipeline location would limit where forest management roads could be layed out

### Native American Areas

The around Puget Sound segment of the pipeline would be located immediately adjacent to and would parallel the west boundry of the Skokomish Reservation for a distance of 3 miles. The adjacent reservation lands are, for the most part, forested. In addition, the pipeline corridor is located within approximately 8 miles of the Nisqually Reservation in Thurston County, and the Muckleshoot Reservation in King County. Native Americans of the Pacific Northwest Region also have fishing rights in areas outside of reservations.

Pipeline construction around Puget Sound might adversely affect areas used by Native Americans for fishing.

Normal operation and maintenance impacts across Native American areas would be similar to those incurred by the land uses described above.

### Natural and Scientific Areas

These are areas in which natural features are preserved for scientific or educational purposes. The Washington State Marine Atlas references numerous sites on Hood Canal and southern Puget Sound that are used for scientific research.

Pipeline construction would not be apt to cause any direct impact to established natural or scientific areas, however construction activity on relatively undisturbed areas would destroy their value for future natural or scientific use.

In Thurston County, Black River Swamp, Millersylvania State Park, and Weir Prairie are being considered for inclusion in the National Registry of National Landmarks. These areas might be impacted by pipeline construction.

Normal operation and maintenance should not cause significant impacts to existing natural and scientific areas although it might preclude the establishment of new areas.

It does not appear likely that an oil spill would impact any natural or scientific areas.

### Wilderness

The around Puget Sound pipeline corridor does not cross any U.S. Forest Service RARE-II Study areas that have been recommended for wilderness designation or allocated for further planning.

Neither pipeline construction nor operation will impact any U.S. Forest Service RARE-II wilderness study areas.

### Land-Use Plans and Zoning

Local land use plans most often describe policies and goals. Seldom do they specifically address utility corridors. Zoning resolutions generally allow utilities in most zoning categories either by right or through a permitting process. It is therefore often a matter of interpretation whether a particular action would be consistent with existing plans and regulations.

Prior to the cross-sound route change, the Energy Facility Site Evaluation Council (EFSEC) determined that the proposed pipeline would be consistent with applicable plans and zoning within the state of Washington. Their findings, however, did not encompass regulations contained in County Shoreline Master Programs, which would be determined later in the permitting process. The NTPC application to EFSEC prepared by Environmental Research and Technology (ERT 1978) found that the pipeline would be inconsistent with Shoreline Master Program regulations in Pierce County at crossings of the South, Voight, Wilkeson and South Prairie Creeks unless automatic shut-off valves are provided on both sides of these crossings.

Where the pipeline corridor crosses Federal lands in Washington, it is subject to U.S. Forest Service management plans. These plans generally require that linear rights-of-way follow existing corridors whenever feasible. Additionally, they contain provisions designed for resource protection.

In general pipeline system facilities would not tend to seriously constrain land-use plans and zoning since virtually all other types of land uses could occur within reasonable proximity to the facilities.

## Transportation and Utility Networks

### Inland Water Transportation

This segment of the pipeline runs parallel to Hood Canal for many miles in western Washington (roughly pipeline miles 34 to 75). The canal is a major natural inland waterway for pleasure boating, commercial and sport fishing, and shellfish gathering. River transportation near the proposed river crossings is limited to recreation-related traffic.

Navigable waters are crossed at locations where there is no significant commercial traffic. Construction impacts are unlikely, although recreation related boating activity might be impacted.

Normal operation of the pipeline system should cause no adverse impacts to inland water transportation.

An oil spill into rivers and streams tributary to Hood Canal and southern Puget Sound would not be likely to transport sufficient quantities of oil into these waterways to have significant impact on transportation activities.

### Railroads

Fifteen major railroads would be crossed by the proposed pipeline. Three major railroads would be paralleled for 10 miles. There may be a limited number of additional crossings of spur lines and unidentified private rail lines.

The possibility of adverse impacts to railroads would occur at the crossings and parallel rights-of-way stated above. Since all railroad crossings would be tunneled, the impact to rail traffic should be limited to possible speed restrictions lasting for 1 week or less through the construction areas. Rail traffic slow downs might be of longer duration where construction is parallel to the railroad through areas confined by topography or other improvements.

Railroads would haul some of the construction materials. Storage yards would generally be located along railroad sidings where the pipe and other materials could be stored. Railroads generally have excess capacity so transporting construction materials would not be likely to cause any adverse impact to rail service.

Normal operation would cause no significant adverse impacts to railroads.

An oil spill within a railroad right-of-way might cause impacts similar to those discussed in the transportation and utility section of chapter 3.

### Roads and Highways

Two Interstates and 14 primary federal and state highways would be crossed along the proposed pipeline corridor.

The secondary road network from Green Point to near Olympia (approximately the first 100 miles of pipeline) is limited by topography and low population. Roads are few and tend to follow the rivers flowing into Hood Canal. In the Puget Sound lowlands (to about pipeline mile 190), the more abundant roads follow a somewhat modified grid pattern. Much of the pipeline route is roughly parallel to and relatively close to major highways and connected to outlying areas by county roads which would be crossed by the pipeline. The more numerous roads in the non-mountainous and more populated areas generally provide reasonable alternative connections between places. The county roads near towns and the numerous other municipal streets and roads which would be crossed when the pipeline would skirt the larger towns carry a substantial amount of local traffic.

The existing road network of federal and state highways, paved and unpaved county roads, unimproved roads, and BPA and other utility access roads would provide access to the pipeline construction corridor along the entire route. Along most of the route, away from towns and cities, these access roads carry quite low volumes of traffic.

In early 1979 the Hood Canal Bridge collapsed during a storm. The bridge, with a 1976 average daily traffic count of 4,977 (Washington State Highway Commission 1976) was a connecting link between Kitsap and Jefferson Counties. The bridge closure is expected to result in higher traffic volumes on U.S. Highway 101. Such a traffic increase might affect the amount of congestion and traffic delays due to pipeline construction-related activities near the highway.

Heavy truck traffic would probably cause some road damage at locations where such traffic would be concentrated near storage yards and pump stations. Weight estimates indicate that approximately 1,200 tons of equipment and materials would be required to construct each pump station.

Construction of permanent access roads to pump stations would require 1 mile or less each. The new permanent access roads are not likely to be significant in any area.

Temporary access roads would be needed at intersections of deeply incised drainages, where pipe stringing trucks (and perhaps other equipment) would not be able to follow the right-of-way. These roads would generally be less than 1 mile in length, and would not appear to significantly impact road and highway networks.

Impacts might occur where the pipeline would cross or be located adjacent to existing roads and highways. Impacts due to construction, operation, and in the event of an oil spill would be similar to those discussed in the transportation and utility section of chapter 3.

Airports

Eight commercial airports, military air bases, and other airfields are located along the pipeline route. There may be additional small landing strips along the route.

Although pipeline construction could occur adjacent to several airports it is not likely any significant impacts would occur. Planned facility expansion at Shelton airport and runway expansion at the Olympia airport would not appear to be affected by the around Puget Sound pipeline corridor. Possible construction impacts to air navigation facilities would be similar to those discussed in the transportation and utility section of chapter 3.

Under normal pipeline operation, inspection flights of the pipeline would be made every 2 weeks. These flights might penetrate the airport traffic areas of one airport with commercial service and smaller general aviation airports. At Olympia, Washington, the inspection flights would pass in the immediate vicinity of the airport with commercial service and substantial (25,000+ operations yearly) traffic.

Electric Transmission

The proposed pipeline corridor would cross 12 major transmission lines and parallel 9 other transmission lines for 147 miles. Where the pipeline route parallels a powerline any crossings that might occur would not be determined until final survey and design were completed. In urbanized areas, there would be many local distribution lines which could be crossed by the pipeline. The location of such crossings would not be known until obtained from local utility offices at the time of detailed land surveys. In rural areas there would be many crossings of distribution lines that frequently parallel roads along township and section lines. The location of these crossings would also be determined when land surveys were carried out.

The pipeline system would require construction of additional transmission lines as shown in table 9.4-30.

In addition to the transmission lines shown in the table distribution lines would be constructed to some block valves and possibly to some communications sites. Construction of new transmission and distribution lines would impact land uses. There is no indication that utilities would be adversely impacted by this level of construction.

The increased electric loads required for and induced by construction would be negligible. The potential for physical damage to transmission lines and utility access roads exists at each of the crossings and along the adjacent or shared right-of-way.

Impacts due to the construction and operation of the pipeline are similar to those discussed in the transportation and utility section of chapter 3.

An oil spill upon the shared or adjoining 147 miles of right-of-way would be of concern because of the resultant vegetation loss, fire hazard, and risk of damage to electrical transmission facilities during pipeline repair. The frequency of oil spill is estimated to be one spill in 2 years.

TABLE 9.4-30 NEW ELECTRICAL SYSTEM FACILITIES REQUIRED IF THE PROPOSAL IS IMPLEMENTED

| Pump Station1/ | Serving Utility | New Transmission Facilities | Estimate of New Right-of-way Area Required |
|---|---|---|---|
| 2 | Mason County PUD | 1/4 mile 230 KV line | 6 acres |
| 3 | Puget Sound Power & Light | 2 miles 115 KV lines | 24 acres |
| 4 | Puget Sound Power & Light | 4 miles 55 KV rebuilt to 115 KV | ---- |

Sources: BPA 1978 Western Area Power Administration 1978; ERT 1978

1/ Pump station 1 is included with the onshore storage facility.

Shared, and to a lesser extent, adjacent rights-of-way would have positive impacts since less right-of-way clearing would be required, existing access roads could be used, visual impact would be reduced, and other impacts would be confined within a similar geographic area.

Communications

In urbanized areas there would be many crossings and much construction parallel with underground and overhead communication lines including telephone and cable TV. The exact numbers and locations of these facililities would not be known until final survey and design were completed.

Outside the urban areas the pipeline parallels an American Telephone and Telegraph (AT&T) cable operated by Pacific Northwest Bell.

Impacts due to construction, operation, and in the event of an oil spill are similar to those discussed in the transportation and utility section of chapter 3.

Unaffiliated Pipelines

Six various types of pipelines would be crossed along this segment. In addition, the route would parallel two existing pipelines for 25 miles. When a shared route is narrow and constricted by topography there might have to be multiple line crossings which cannot be precisely located at this time. In local urbanized areas, many natural gas, water, sewer, and storm sewer pipelines would be crossed. The locations of these smaller local pipelines would be obtained from the local private and municipal utility offices at the time of detailed land surveys.

The possibility of construction damage to other major pipelines would occur at the six crossings and along 25 miles of adjacent or shared right-of-way. The significance of this unlikely, although possible, impact would depend on the type of pipeline damaged and the location and extent of the damage.

### Recreation

The section from Green Point to Olympia, Washington, experiences heavy recreational use of its shoreline, adjacent Olympic National Forest, and Olympic National Park.

The type, magnitude and degree of impacts to recreationists and recreational use areas are, in general, similar to those associated with the proposed cross-sound preferred route segment.

Construction and abandonment activities would primarily affect tourists, pleasure drivers, and those requiring access to destination points on the Olympic Peninsula. Use of U.S. Highway 101, the only direct road to Port Angeles, would be congested during construction activities. This would affect a significant, however unknown, number of individuals who require access to the Olympic National Forest or Olympic National Park; who participate in day use activities along the Hood Canal, or who are tourists bound for Port Angeles, Washington, or Victoria, British Columbia. Highway congestion is compounded by the 1979 loss of the Hood Canal bridge.

In the vicinity of the proposed corridor there are numerous campgrounds, trails, picnic, and wayside park areas. Two state parks, Millersylvannia and Nolte, are crossed by the corridor. U.S. Highway 101, which provides easy access to a variety of recreational areas in the Olympic National forest and Olympic National Park is heavily used by recreationists. Recreational use of shoreline state parks along Hood Canal and the southern portion of Puget Sound accounted for about 25 percent of all state shoreline park usage in 1978. The use of state shoreline parks is considered to represent a small portion of all recreational use of marine areas. Intensity of use in these areas is approximately the same as for Central Puget Sound, the area crossed in the Northern Tier proposal. According to 1977 Salmon Punch Card Data, 10 percent of the total marine sport salmon catch in Washington was taken from the southern portion of the Puget Sound area including Hood Canal during an estimated 187,500 marine salmon angler trips (Washington Department of Fisheries 1977). Important river recreational salmon fisheries are found in the Dosewallips, Duckabush, Hamma Hamma, and Skokomish Rivers. Patterson, Crocker, Tarboo, and Leland Lakes are freshwater lake recreational fishing areas. Bottom fishing in the Tacoma Narrows is considered to sustain an excellent catch. Overall, recreational bottomfishing in Hood Canal and the southern portion of Puget Sound captures about 50 percent of the total Strait, Sound, and coast catch. Shellfish harvest is an important recreational as well as commercial activity in the Canal.

Eighty percent of the recreational shellfish catch in Puget Sound is from Hood Canal (SRI 1978). Based on a 2-year average of recreational use data, approximately 220,000 recreational user trips occur each year in Hood Canal. Scuba diving often complements sport shellfish collection. Other diving activity occurs in established underwater parks. These are designated areas known for underwater interest and may feature historic shipwrecks or unique rock or coral formations.

Both the Skokomish and Green Rivers are considered to have high scenic and recreational values by the State of Washington. A pipeline crossing would conflict with Washington State management guidelines as defined in the 1971 Washington State Shorelines Act. In addition, the corridor along the Green River from Kummer Bridge site to Kanasket was designated in 1969 by state legislation as the Green River Gorge Conservation Area. The proposed pipeline would cross this area just downstream from Kanasket and along the border of the Jellum State Park site. The noise from construction activities and visually changed character would detract from use of the adjacent Jellum State Park site for the duration of the project.

Both Millersylvannia State Park and Nolte State Park are within the two mile corridor; however no facilities are located in the areas crossed. Impacts would consist of visual intrusion of the corridor for the life of the project and noise harassment for the short term (less than 1 month). Nolte State Park is considered part of the Green River Gorge Conservation area.

Normal operation would not affect most recreational use. Off road vehicle use of the right-of-way and access road would probably occur.

An oil pipeline leak could affect the shellfisheries and shoreline park use along Hood Canal. An average of 220,000 recreationists participate in shellfish collection along Hood Canal each year. Contamination of all beds for the estimated in four year shellfish bed recovery period could affect a minimum of 880,000 recreationists. Shoreline parks along Hood Canal had over 3 million visits in 1978. Oil contamination beach areas would be unuseable for one to two months and could affect a minimum of 400,000 to 800,000 recreationists (assuming 1 month loss of use) if a pipeline break occurred between June and August.

A worse case pipeline rupture and leak along Hood Canal would not affect as many recreationists as a worse case submarine pipeline break between Port Williams and Point Partridge. The lack of flushing mechanisms would create a longer term and more severe local situation along Hood Canal from the same size of pipeline leak.

Other uses which would be affected for the short term include marine fishing, boating, and river fishing of the Dungeness, Dosewallips, Duckabush, Hamma Hamma, and Skokomish Rivers.

## Social and Economic Conditions

### Population

The population of Clallam, Jefferson, Mason, Thurston, Pierce, King, and Kittitas Counties, and the number of peak construction period work force are provided in table 9.4-31. Due to the relatively brief period during which peak construction demands would occur, no significant impacts would be created by the estimated work force and associated persons on the existing population. Work force estimates for the operation phase would not significantly affect population projections.

### Infrastructure

According to a study prepared by SRI International, there will be ample housing for the estimated peak construction period work force population except in Mason County where housing availabilities would be strained (1978).

Due to the relatively short period of peak construction in the various counties no significant impacts would be expected to occur on public utilities, school systems, medical services or police and fire protection services.

## TABLE 9.4-31 SOCIAL DATA FOR COUNTIES ADJACENT TO AROUND PUGET SOUND ROUTE SEGMENT

| County | Type* | Land Area (sq. miles) | 1977 population | Density (Persons /sq. mile) | Annual Growth rate 1970-1975 | Projected Population 200 | Projected Annual Growth Rate 1977-2000 | Medical Facilities | | | | Estimated Peak Workforce Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Hospitals city/beds | | Intensive care unit | No. of Personnel | |
| Clallam | R | 1,753 | 41,100 | 24 | 3.54 | 55,900 | 1.35 | Forks | 2 | x | 62 | 539 |
| | | | | | | | | Port Angeles | 86 | x | 250 | |
| Jefferson | R | 1,805 | 12,600 | 7 | 2.20 | 18,400 | 1.66 | Port Townsend | 31 | x | 68 | 28 |
| Mason | S/U | 962 | 23,537 | 24 | 2.56 | 36,800 | 1.96 | Shelton | 66 | x | 177 | 128 |
| Thurston | S/U | 714 | 92,549 | 130 | 4.24 | 178,500 | 2.90 | Olympia | 210 | x | 761 | 86 |
| Pierce | S/U | 1,676 | 415,707 | 248 | -0.12 | 541,000 | 1.15 | Buckley | 37 | no | 48 | 309 |
| | | | | | | | | Ft. Steilocoom | 921 | x | 913 | |
| | | | | | | | | Puyallup | 173 | x | 476 | |
| | | | | | | | | Steilacoom | 50 | x | 20 | |
| | | | | | | | | Tacoma hospitals-mostly large | | | | |
| King | U | 2,128 | 1,164,000 | 547 | -0.18 | 1,551,500 | 1.26 | Auburn | 104 | x | 278 | 264 |
| | | | | | | | | Bellevue | 177 | x | 411 | |
| | | | | | | | | Enumclaw | 38 | x | 95 | |
| | | | | | | | | Kirkland | 76 | x | 277 | |
| | | | | | | | | | 108 | x | 64 | |
| | | | | | | | | Seattle - 22 hospitals-many large | | | | |
| Kittitas | R | 2,317 | 25,600 | 11 | 0.30 | 28,100 | 0.41 | Ellesnburg | 50 | N/A | N/A | 415 |

Source: U.S. Department of Commerce, Bureau of the Census, County and City Data Book 1977; SRI International, Northern Tier Environmental Assessment-Technical Report April 1978; American Hospital Association Guilde to the Health Care Field,1978; American Hospital Association, Chicago, IL.

N/A - Not available

* R - rural; S - suburban; U - urban.

Makah

### Social Well-Being and Quality of Life

Negative effects on indicators of the quality of life would occur from implementation of the proposed alternative. During construction rural landowners would have to adjust to construction activities. Their life styles would be altered temporarily. Construction activities with associated noise, dust, and traffic pattern changes would affect residential perceptions of the aesthetic setting, quality of air, and the region "as a place to live" during the construction phase. However, these would not be significant adverse impacts.

The proposed pipeline route would involve counties in which seven Indian reservations are located. In Clallam County these are the Makah, Lower Elwha Tribal Community, and the Quileute. Mason County includes the Skokomish and Squaxin reservations. The Nisqually reservation is in Thurston County, and the Puyallup reservation is in Pierce County.

These tribes oppose implementation of the alternative maintaining that potential oil spills would adversely affect their fishing enterprises.

## CUMULATIVE IMPACTS: POTENTIAL TO SUPPLY PUGET SOUND REFINERIES

Construction of the crude oil transportation system using the around Puget Sound segment would make possible an alternate method of supplying 350,000 bpd of crude oil to four existing refineries located on the east side of Puget Sound. These refineries are presently being supplied by tankers. Development of this supply would require actions by both NTPC and others.

### Tanker Unloading Facilities

NTPC would be required to expand the Port Angeles port and onshore storage fcility to accommodate the additional 350,000 barrels per day throughput. Increased tanker calls per year would also be required such as 395 port calls per year for the 933,000 barrels per day increased to 511 port calls per year for 1,283,000 barrels per day throughput. The description of the action required by NTPC has been presented in the section on Cumulative Impacts: Potential to Supply Puget Sount Refineries in chapter 6, Environmental Analysis of the Action at Port Angeles. Oil spill risk and fire and explosion data are also presented.

### Pipeline System

In order to provide 350,000 bpd of crude oil to the four Puget Sound refineries, the intial 198 miles of the proposed pipeline, from Green Point to North Bend, Washington, would be used. The proposed 42-inch pipeline would have the capacity for the increased throughput of 1,283,000 bpd, but pump station arrangements would need to be modified. Three new pump stations would be required in addition to the three which are proposed along the 198-mile segment.

If the need to provide the 350,000 bpd throughput for the Puget Sound refineries was determined prior to intial operation and in time to redesign the initial 198 miles of the pipeline system prior to the beginning of construction, only five pump stations would be required instead of the six listed above.

The expanded pipeline system would also require delivery facilities with approximately 2.1 million barrels of storage capacity near North Bend. From that delivery facility some company other than the Northern Tier Pipeline Company would be responsible for construction of a pipeline segment to connect North Bend to the existing Trans Mountain Pipeline System near Burlington, of approximately 1 million barrels of operating tankage near North Bend and approximately 500,000 barrels of tankage at Burlington.

Table 9.4-32 shows the results of the oil spill risk analysis for pipeline spills with the increased throughput.

The risk of fire damage at pump stations is another potential adverse effect which is greater with the increased throughput. Table 9.4-33 presents the results of the fire risk analysis for the 198-mile segment from Green Point to North Bend.

TABLE 9.4-32 ESTIMATED FREQUENCY OF PIPELINE SPILLS
(For throughputs of 1,059,000 bpd and 1,283,000 bpd,
Green Point to North Bend, plus North Bend to Burlington)

| Spill Magnitude (in barrels) | Spill Frequency and Uncertainty 1/ One Spill Every: |
|---|---|
| 2.4 - 10 | 4.8 years (2.2 - ) |
| 10.1 - 100 | 3.6 years (1.7 - ) |
| 101.0 - 1,000 | 14.3 years (6.7 - ) |
| 1,001.0 - 10,000 | 50.0 years (33 - ) |
| 10,001.0 - 100,000 | 500.0 years (250 - ) |
| Any spill ≥ 2.4 | 1.7 years (0.8 - ) |

Source: OIW 1978

1/ The ranges shown in parentheses are estimates of the 95 percent confidence limits based on derived historical pipeline spill rates, and were calculated by assuming that the variance for each spill category was equal to the variance of the data for all pipeline spills. Upper limits are unpredictable and indicated by a dash.

TABLE 9.4-33 ESTIMATED FREQUENCY OF FIRE DAMAGE AT PROPOSED NTPC PUMP STATIONS 1/
(For throughputs of 1,059,000 bpd and 1,283,000 bpd - Green Point to North Bend)

| Fire Damage Magnitude | Fire Frequency and Uncertainty 2/ One Fire Every: |
|---|---|
| $ 1,000 - $ 10,000 | 65 years (45-95) |
| $ 10,000 - $100,000 | 105 years (80-155) |
| $100,000 - $500,000 | 255 years (190-380) |
| over $500,000 | 1,660 years (1,250-2,470) |
| Any fire ≥ $1,000 | 33 years (25-49) |

Source: OIW 1978

1/ For fires causing damages greater than $1,000.

2/ The ranges shown in parentheses for each fire damage magnitude category are estimates of the 95 percent confidence limits, and were calculated by assuming that the variance of each fire damage magnitude category was equal to the variance of the data for all fires.

## COEUR D'ALENE

This alternate route segment was originally the proposed pipeline route across a part of the state of Idaho. The route passed north of the city of Coeur d'Alene and crossed for a significant distance (25 miles) over the Spokane-Rathdrum Aquifer. The ground water from this aquifer serves a large public demand for the major cities of Coeur d'Alene, Idaho, and Spokane, Washington, as well as the surrounding rural agricultural area. Following the Northern Tier Pipeline Company announcement of the pipeline route across the Spokane-Rathdrum Aquifer, public and government opposition developed to potential oil contamination. The U.S. Environmental Protection Agency officially designated the aquifer as a "Sole Source Aquifer" (February 1978). That designation prohibits action on projects that would create a potential hazard to public health. Consequently, NTPC developed a new pipeline route to avoid the aquifer. The description and environmental analysis of the Coeur d'Alene route segment is presented in the following discussion.

### Description

The Coeur d'Alene alternate departs from the proposed route near Spangle, Washington, travels northeast and then passes south of the city of Spokane, crossing the Spokane River and then east across the Washington-Idaho State boundary (fig. 9.4-9). The route then proceeds north of the city of Coeur d'Alene, paralleling a powerline right-of-way through the Idaho Panhandle National Forest and joining the prime route near Kingston, Idaho, adjacent to Interstate 90, for a total distance of 85 miles.

### Climate and Air Quality

No impacts on climate are anticipated for this alternative pipeline route.

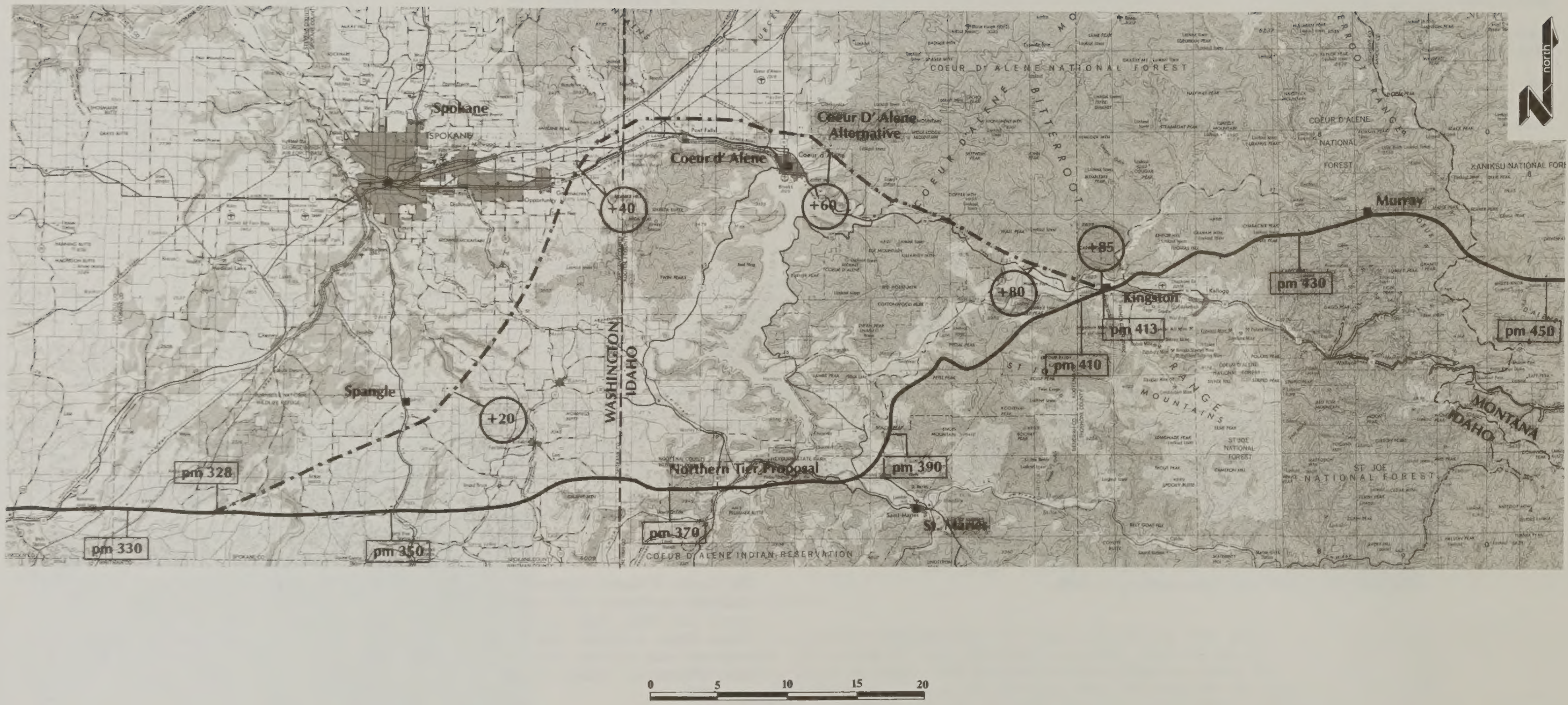


Figure 9.4-9

Northern Tier Pipeline Company

Coeur d'Alene
Route Segment Alternative

Air quality impacts would be similar to those for the other alternative route segments.

## Noise

Noise impacts associated with pipeline construction and operation would be similar to those for the other alternative route segments. Some residential areas east of Spokane, Washington, and in Coeur d'Alene, Idaho, would be affected by construction noise.

## Topography and Geology

This route segment alternative is characterized by rolling hills and lakes, the broad, nearly flat Spokane Valley and the moderatley steep Coeur d'Alene Mountains. While similar to the proposed route between pipeline mile 335 and Cataldo Mission (pipeline mile 410) the terrain is less steep and topographic impacts, consiting of minor landform changes and short-term drainage alterations, would be less severe than along the proposed route.

Geologic material, consisting of Quaternary glacial debris, windblown silt (loess), alluvium, lower Tertiary volcanic rock, and Precambrian sedimentary/metasedimentary rocks, is similar along both routes. Consequently geologic impacts, which would consist of the removal of large volumes of geologic material and some excavation-induced (including blasting) alterations of the physical characteristics (e.g., permeability, porosity, and inherent rock strength), would be essentially the same.

Like the proposed route, this route segment alternative is in an area of moderate seismic activity corresponding to a Seismic risk Zone 2 (moderate earthquake damage expected). As neither route would encounter active or potentially active faults and both routes have experienced similar levels of seismic activity, the anticipated impacts from surface fault rupture and ground shaking would be the same.

Potential slope instability problems (landslides and/or liquefaction) are more numerous along this route segment alternative—Coeur d'Alene alternate pipeline miles 0 to 28, 30 to 32, 34 to 39, 58, 60, and 68 to Cataldo Mission (proposed route pipeline mile 410). Consequently, anticipated impacts are expected to be greater.

## Mineral Resources

Based on available information, there is no significant difference in impacts to mineral resources.

## Soils

Deep silt loam soils are evident from Spangle, Washington, to the Spokane River and constitute about 30 percent of the route segment. The section is part of what is known locally as the "Palouse Hills Country." The soils are highly susceptible to wind and water erosion.

From the Spokane River and across the Spokane Valley to Coeur d'Alene the principal soils are Garrison loam and gravelly loam. These soils, which constitute about 35 percent of the route, occur on nearly level to gently rolling slopes. They are characterized by gravelly, stony surfaces and rapidly permeable subsurfaces. The remaining part of the route traverses mountain ridges and valley side slopes of the Coeur d'Alene mountain range. The soils are moderately deep, medium textured and rocky on steep and very steep slopes.

The major impacts on soils would be erosion from water and wind when the right-of-way lacked protective vegetation. Much of the route between Spangle and Spokane River lies across farmland with normally high erosion rates. Soil losses from water erosion are often as much as 70 tons per acre on steep slopes in a single season. Average losses on cropland in this area are 10 to 12 tons per acre per year (Idaho-Washington RCD Project 1964). After construction, similar rates would be expected. Wind erosion on unprotected soils in this area would be about 15 tons per acre per year, assuming unprotected distances of 1,000 feet. Since half of the cropland is normally fallow each year, impacts attributed to pipeline construction would be 50 percent less than for noncropland.

Erosion losses would be less severe in the Spokane Valley where slopes are more gentle and the soils are gravelly. Unprotected soils would lose an estimated 2 tons per acre per year as compared to 0.05 tons per acre per year that would be expected with grass cover.

Severe impacts from erosion would occur in the mountainous area after removal of the forest vegetation and the surface litter. Normal losses of 0.40 tons per acre per year would increase to 30 tons per acre per year during construction. Revegetation with native grasses and shrubs would reduce those losses to about 2.0 tons per acre per year.

Impacts from soil compaction and profile mixing would be similar to those expected on the proposed route. A loss of about 5 percent of productive capacity would be expected. The impact from compaction would not be apparent after 2 years. Loss of fertility from profile mixing would be permanent.

Impacts from potential oil spills would also be similar to those on the proposed route.

## Aquatic Resources

### Physical Components

One major and approximately 24 minor streams would be crossed by the Coeur d'Alene alternative route segment. The only major river crossing would be the Spokane River. This river generally has seasonal variation of discharge with low flow periods usually occurring in August or September and maximum flow anticipated between March and May. Stream flow is controlled somewhat by storage in Coeur d'Alene Lake. Water quality classification for the Spokane River by the state of Washington (WAC 173-201) is class A indicating excellent quality water.

The Spokane-Rathdrum aquifer consists of unconsolidated glacial deposits which have a high capacity to store and transmit large quantities of water (Drost and Seitz 1978). The U.S. Environmental Protection Agency designated the Spokane-Rathdrum Prairie aquifer a "sole source" aquifer in February, 1978. Consequently, Federal assistance for any project that "may contaminate the aquifer through a recharge zone so as to create a significant hazard to public health" is prohibited by law. The aquifer is the principal public source of drinking water for individual wells, and public water supplies in Kootenai County, Idaho, and Spokane County, Washington.

Construction and operation of the pipeline would impact surface and ground water resources. Short-term increases in suspended solids would occur at and downstream of the river crossings. Construction during the August-September low flow period would minimize the impact. Trenching activities over the Spokane-Rathdrum Prairie aquifer would probably allow sediment laden waters to percolate to the water table, especially near the Spokane River crossing, causing short-term water quality degradation. Hydrostatic test water could be withdrawn from the Spokane River. Withdrawal during low flow periods could reduce river flow by as much as 10 percent. Normal operation of the pipeline would have no major adverse impact on water sources. However, in the event of a pipe rupture, oil would impact both surface and ground water causing water quality degradation. At the Spokane River crossing, the pipe would be laid within the aquifer. A leak would cause crude oil to seep into the aquifer at a point about 2 miles up gradient of three public supply wells. Relatively low concentrations of oil would render the water unsuitable for municipal consumption. Refer to chapter 3, Physical Components, for a more detailed discussion of impacts.

## Biological Components

Rock Creek, Spokane River, Blue Creek, and Wolf Lodge Creek are the major streams supporting fishery resources along this route segment alternative. Rock Creek supports a rainbow trout fishery and the Spokane River supports rainbow, brook and cutthroat trout, whitefish, perch and small-mouth bass. Significant trout spawning habitat occurs at the Spokane River crossing. Blue and Wolf Lodge Creeks provide spawning and rearing habitat for kokanee and lakerun cutthroat. Trout and kokanee populations would be reduced by spawning gravel sedimentation from instream trenching activities during construction and streambank erosion during project operation. Most of the sediment from instream trenching would be washed out of the spawning gravel during the first period of high flow, but sediment arising from streambank erosion would continue for several years until complete revegetation occurs. The greatest reduction to trout and kokanee populations would occur during construction and for the first few years of project operation. Several spawning cycles would be required for these reduced populations to recover to preproject levels; most populations should recover in a few years. The initial population reductions could fall below the normal range of population fluctuations and consequently would be evident. In subsequent years as revegetation occurred and erosion decreased, fish numbers would begin to return to the normal range of population fluctuations.

Fish populations would be reduced by an oil spill during project operation. An oil spill on Blue or Wolf Lodge Creek would probably reach Coeur d'Alene Lake where it would cause substantial fish losses. Several spawning cycles would be required for the reduced fish populations to recover to prespill levels.

Since fewer streams supporting fish populations would be crossed and fewer streams tributary to Coeur d'Alene lake would be crossed in this alternative route segment, the overall potential impacts to fisheries resources would be less than those associated with the proposed route.

Refer to chapter 3, for a more detailed analysis of fisheries impacts.

### Terrestrial Vegetation

Most of the vegetation impacted by construction of the proposed pipeline is associated with conifer forest. Trees, including hemlock, grand fir, and Douglas-fir, averaging 60 years old with a density of about 2,000 per acre, could be lost (U.S. Forest Service 1978). Younger and older trees and other species would also be impacted. This alternative would impact 5.2 miles and 57 acres of National Forest and would result in an annual loss of approximately 4,845 cubic feet of potential timber productivity (U.S. Forest Service August 1978). The shrub-forb vegetation that would become established after construction could improve habitat through increased diversity, browse production, and increased lower vegetative cover.

The long-term impact would be positive in forested areas, at least for some vegetation and wildlife, especially deer and elk, because more browse would be available from the shrubs-forbs and small trees permitted to remain established on the right-of-way. The short-term impacts on agricultural vegetation could depend substantially on time of construction Long-term impacts should be minimial.

The impacts on vegetation and wildlife from abnormal operation--specifically an oil spill--would be substantial.

At this time there are no known state or federally designated threatened or endangered plant species that would be significantely impacted by construction of this route segment.

### Terrestrial Wildlife

Bald eagles winter at the Wolf Lodge Bay area within 0.4 miles of the alternate route (table 9.4-34). The population varies between 40 and 70 from late November to mid-March (Lint 1977). The area is influenced by human disturbance, bordered by Interstate 90 on the north and Idaho Route 95A to the east and south. Known white-tailed deer wintering areas, used from December to March, are located along the north shore of the Coeur d'Alene Lake in the vicinity of Wolf Lodge Bay and along Wolf Lodge Creek, Blue Creek, Alder Creek and east along the corridor to the Fourth of July Summit.

White-tailed deer Bureau of Land Management

TABLE 9.4-34 WILDLIFE IMPACTS FOR THE COEUR D'ALENE ALTERNATIVE

| State | Endangered Species | Other Species | Season | Location | Impacts |
|---|---|---|---|---|---|
| Spangle, Washington<br>Coeur d'Alene, Idaho | Bald eagles 40-70 | | Late-November to Mid-March | Wolf Lodge Bay area 0.4 miles from alternative | Disturbance of roosting and nesting bald eagle areas<br>Line-of-sight visibility of construction activities<br>Possible synergistic effect from disturbance of Interstate 90 and Highway 95A and increased human influence from pipeline construction activities<br>Potential elimination of a stable bald eagle population |
| Spangle, Washington<br>Coeur d'Alene, Idaho | | White-tailed deer | Winter range December to March | North Shore of Coeur d'Alene Lake in vicinity of Wolf Lodge Bay and along Wolf Lodge Creek, Blue Creek | Increased browse production<br>Removal of thermal cover<br>Increased vehicular access<br>Increased harvest pressure |
| Spangle, Washington<br>Coeur d'Alene, Idaho | | Elk | Winter Range | North and East sides of Coeur d'Alene River from Enaville 8-10 miles up river | Removal of thermal cover disrupting movement, distribution and level of possible use; alteration of successional stages of vegetation used for browse |
| | | Waterfowl | Nesting and staging areas winter and summer | Mission Flats area | Destruction of riparian habitat<br>Marsh drainage<br>Disturbance of staging and nesting waterfowl areas |

## Cultural Resources

The cultural resource sites listed below would potentially be affected by this route segment alternative. Of the known sites the Mullan Road has been designated as a National Historic Civil Engineering Landmark, the Wagner-Dydball Grist Mill and the Cataldo Mission are included in the National Register of Historic Places and a segment of the Mullan Road in the Fourth of July Summit area on national forest lands has been nominated to the National Register. There is high potential for discovery of additional archaeological and historic sites all along this route segment alternative. The currently known sites are shown on table 9.4-35.

Potential impacts to these sites and to any presently unrecorded sites would be the same as those discussed in chapter 3.

## Visual Resources

The first two-thirds of this segment traversed by the pipeline is generally open farmlands and passes through small community developments and rural areas. Pipeline construction should have a moderate to high visual impact initially and decrease to the low range during the operation phase. Pipeline construction through the forested remaining portion of this section will require the clearing of a 90-foot right-of-way visible from several points along Interstate 90, which the alignment would parallel. This would cause an adverse visual impact persisting for many years.

## Land Use

This alternative route segment would have slightly greater land use impact because it crosses developing urban fringe areas, numerous small landholdings and irrigated lands between Spokane, Post Falls, and Coeur d'Alene. Nuisance impacts during construction, and the impacts which might result from an oil spill, as described in chapter 3, would be slightly more severe on this route than through the less intensively developed areas along the proposed route. Construction activity would require the use of approximately 120 acres more land than the proposed route with about 70 acres additional land area required for permanent right-of-way outside of existing rights-of-way (assuming that only 50 feet of additional right-of-way would be needed along existing corridors). This route avoids crossing the Coeur d'Alene Indian Reservation.

## Transportation and Utility Networks

The potential for adverse impacts to transportation and utility systems would be higher than for the proposed route because there are more crossings and an additional 55 miles where pipeline construction would be parallel and adjacent to existing roads, railroads, and unaffilitated pipelines.

Existing roads and highways provide good access for construction and fewer miles of access road would be needed during pipeline construction.

The electrical power demands and potential impacts to regional power supplies are comparable to the proposed route.

TABLE 9.4-35 CULTURAL RESOURCES FOR THE COEUR D'ALENE ALTERNATIVE

| County, State | Site Number | Site Name | National Register | Site Type | Location By Pipeline Mile |
|---|---|---|---|---|---|
| Washington | | | | | |
| Spokane | | Mullan Road | National Historic Civil Engineering Landmark | 19th century military, commercial 2nd settlement history | 1-10 |
| Spokane | | Wagner-Dydball Grist Mill | Yes | 19th and early 20th century architecture and industry | 8 |
| Spokane | 45SP30 | Bradford-Kennedy Mill | No | Early 20th century lumber industry | 46 |
| Idaho | | | | | |
| Kootenai | 10KA6 | | No | Prehistoric campsite | 65 |
| Kootenai | | Mullan Road | Portions nominated | See above | 69-85 |
| Kootenai | 10KA49 | Mullan Tree | Nominated | Historic monument | 75 |
| Kootenai | 10KA39 | | No | Prehistoric occupation site | 83 |
| Kootenai | 10KA3 | | No | Prehistoric campsite | 84 |
| Kootenai | 10KA1 | | No | Prehistoric campsite | 84 |
| Kootenai | 10KA45 | Cataldo Mission | Yes | 19th century mission | 84 |
| Kootenai | K0KA57 | | No | Historic homestead | 84 |
| Kootenai | 10KA43 | | No | Prehistoric campsite | 84 |

## Recreation

Kootenai County is considered the recreational center for the region (SRI 1978). Weekend tourist and local use draws from the Spokane and Silver valley areas.

Lake Coeur d'Alene is locally and regionally important for sport kokanee salmon and trout fishing as well as other water-related recreation. A pipeline leak or rupture affecting ground water and streams flowing into the lake would affect a significant, although unknown, number of recreationists. Hunters and wildlife viewers could experience a decrease in satisfaction if game left the area during the construction and abandonment phases. Congestion and activities along Interstate 90, which the Forest Service considers to be a scenic travelway, would affect those recreationist seeking day use destination points along the highway or along the Coeur d'Alene River. Construction or abandonment activities cross over four miles of national forest in the Fourth of July Summit area (U.S. Forest Service 1978) and may affect the Mullan Tree site (pipeline mile 75) and Mullan Road (pipeline miles 69-85). During 1977, 1,500 visitor days use occurred at the Mullan Tree, a site which accommodates only 20 people at one time.

As compared to the proposed route, this alternate would impact a greater number of recreationists.

## Social and Economic Conditions

Counties affected by this alternative would include Spokane in Washington and Kootenai and Shoshone in Idaho. The impacts would be similar to those resulting from the proposed route. A discussion of those impacts is found in chapter 3 of this report.

Impacts on population, housing, and community infrastructures would be low and short-term, ending when the construction was complete. Fire departments are largely volunteer and would be strained by a major fire. Benefical impacts would result from increased assessed valuation and property taxes. This alternative would completely avoid the Coeur d'Alene Indian Reservation and Benewah County, so the tribe and the county would not receive the economic benefits that they would accrue from the proposed route.

# COEUR D'ALENE RIVER

This Coeur d'Alene River alternative was examined by the Northern Tier Pipeline Company as an alternative to the proposed route. From Kingston, Idaho, (pipeline mile 413) to Delta (pipeline mile 430), the proposed pipeline route along Jackass Ridge would have one underwater crossing. This alternative route segment would have 12 Coeur d'Alene River crossings. The following description and environmental analysis compares this alternate route segment to the proposed route along the Jackass Ridge.

## Description

The Coeur d'Alene River alternative originates near Kingston, Idaho (pipeline mile 413), then follows the Coeur d'Alene River, southeast along Beaver Creek to Delta joining the proposed route west of Delta, Idaho, at pipeline mile 430 (fig. 9.4-10). This alternative would be a total distance of 23 miles compared to 17 miles for the proposed route.

## Climate and Air Quality

No impacts on climate are anticipated for this alternative pipeline route.

Air quality impacts would be similar to those for the other alternative route segments.

## Noise

Noise impacts associated with pipeline construction and operation would be similar to those for the other alternative pipeline route segment. Only scattered residences would be located in the vicinity of the pipeline route.

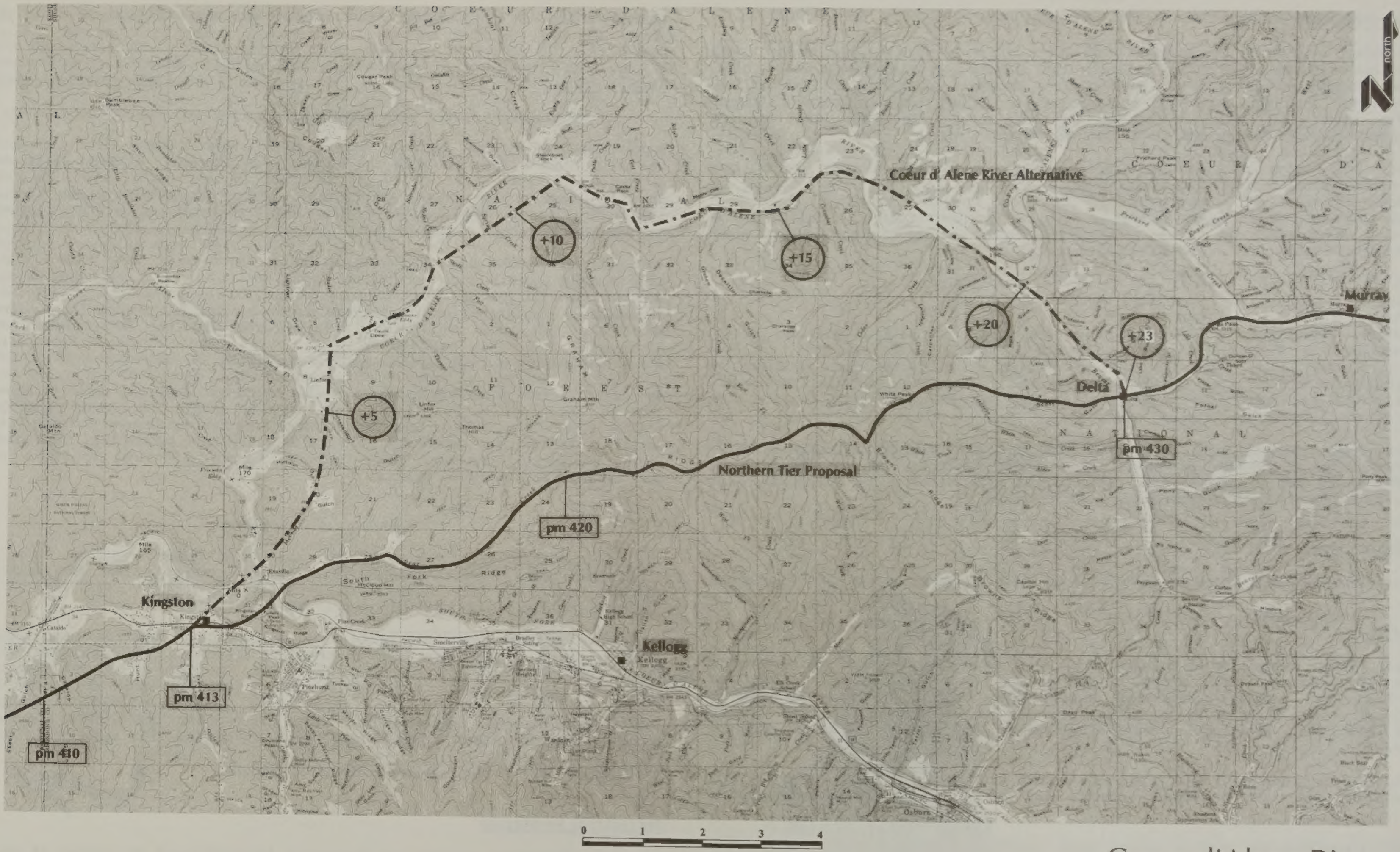


Figure 9.4-10

Northern Tier Pipeline Company

Coeur d'Alene River
Route Segment Alternative

## Topography and Geology

In marked contrast to the proposed route which follows a ridge for most of its length and has only one major stream crossing, this route segment alternative would follow the steep-walled valley of the Coeur d'Alene River and would involve 12 major river crossings. Much more excavation would be necessary along this route segment alternative which would result in substantially more acreage disturbed. The resultant impacts would be much greater than along the proposed route.

While both routes would encounter Precambrian sedimentary/metasedimentary rocks, this route segment alternative would encounter, in addition, Quaternary alluvium along the Coeur d'Alene River. The presence of this loose material, as well as the steeper terrain, would result in the excavation of a much greater volume of geologic material than along the proposed route. Consequently, impacts to the geologic material would be greater along this route segment alternative.

### Geologic Hazards

Although both routes would be within an area of moderate seismic activity, corresponding to a Seismic Risk Zone 2 (moderate earthquake damage expected), and have experienced similar levels of seismic activity, this route segment alternative would cross both steeper terrain and more easily liquefiable material (Quaternary alluvium). Consequently, the potential impacts from seismic activity would be much greater than along the proposed route.

Although no locations have been identified along either route showing slope instability problems, the steeper slopes and looser geologic material along the Coeur d'Alene River would seem to indicate that the potential impacts from slope instability would be much greater there than along the proposed route.

### Mineral Resources

No significant difference in impacts to the mineral resources has been identified.

## Soils

This 23-mile segment would traverse stony silt loam, and stony loam soils occurring on steep mountainous side slopes, ridges, and undifferentiated alluvium of the Coeur d'Alene River. Major impacts would occur in the form of soil erosion on the steep slopes. Soil losses up to 70 tons per acre per year would occur on slopes stripped of vegetation. Revegetation would reduce losses to less than 2 tons per acre per year.

Pipeline construction on the steep side slopes would require extensive cut and fill earthwork and would permanently disturb many acres of undisturbed forest soils.

Soil compaction and profile mixing would result in impacts consistent with those expected to occur on the proposed route. An estimated 5 percent of soil productivity would be lost. Soil compaction would not be apparent after 2 years. A permanent loss of natural fertility would result from profile mixing.

Impacts from potential oil spills would also be consistent with those of the proposed route.

## Aquatic Resources

### Physical Components

Approximately 22 streams would be crossed by the Coeur d'Alene River alternative. The Coeur d'Alene River would be the largest river crossed. Seasonal variation of streamflow is typical. Low flow periods occur in late summer; high flow can be expected in spring with snowmelt and rainfall. Some heavy metals, copper, iron, and lead, have been found in the Coeur d'Alene River. Water can be characterized as calcium-magnesium sulfate type.

Several impacts would occur from construction and operation of the pipeline. Cumulative sediment and siltation impacts would occur during and for a short time following construction. Various heavy metals would probably be resuspended and/or dissolved as a result of disturbance of the contaminated bed sediments causing toxic effects. Hydrostatic test water would probably be withdrawn from the Coeur d'Alene River. Withdrawal could reduce baseflow by 15 percent if taken during mean flow periods. Normal operation would not have a major adverse impact.

An oil spill from pipe rupture could degrade water quality. Oil would be released into the Coeur d'Alene River and if not contained within 1 day would reach Coeur d'Alene Lake. Coeur d'Alene Lake is a recharge area for the Spokane-Rathdrum Prairie Aquifer. This aquifer received a sole source designation by the U.S. Environmental Protection Agency in February, 1978. Refer to chapter 3, Physical Components, for a more detailed discussion of impacts.

### Biological Components

The Coeur d'Alene River, the major river supporting fishery resources along this alternative route segment, provides spawning and rearing habitat for cutthroat, rainbow, brook, and Dolly Varden trout, whitefish and kokanee. Fish also use the river as a migration corridor and spawn in the tributaries.

Reductions to these populations would occur as a result of spawning gravel sedimentation which would come from instream trenching activities during construction and from streambank erosion during project operation. Recovery of reduced populations would take several years. Reductions to fish populations would also occur downstream from an oil spill site if one should occur. Recovery of these reduced populations would also take several years. An oil spill in the Coeur d'Alene River would probably flow into Coeur d'Alene Lake where substantial fish kills could occur.

See chapter 3 for a more detailed analysis of impacts.

## Terrestrial Vegetation

For this alternative segment the vegetation impacted would be similar in species composition. The proposed route would impact about 121 acres of forestland with high productivity potential compared with 41 acres impacted by this alternative segment.

The impact on riparian vegetation resulting from construction of this alternative should be substantially greater than that resulting from construction of the proposed route on Jackass Ridge. This greater impact would be due to the 12 Coeur d'Alene river crossings. However, riparian habitat, dominated by cottonwood and willow, are common vegetation components in the area.

No endangered or threatened species are known to occur within this corridor.

## Terrestrial Wildlife

Deer and elk winter range occurs on the south and west-facing slopes and in the bottoms along the Coeur d'Alene River (see table 9.4-36 for impacts to wildlife). About 0.9 mile of winter habitat on national forest would be crossed on this alternative (U.S. Forest Service 1978).

## Cultural Resources

The known cultural resource sites which would potentially be affected by this route segment alternative are listed in table 9.4-37.

There is high potential for discovery of additional archaeological and historical sites all along this route segment alternative. Potential impacts to the known sites and to any presently unrecorded sites would be the same as those discussed in chapter 3.

TABLE 9.4-36 WILDLIFE IMPACTS ALONG THE COEUR D'ALENE RIVER ALTERNATIVE

| | Endangered Species | Other Species | Season | Location | Impacts |
|---|---|---|---|---|---|
| Kingston Coeur d'Alene River | None | White-tailed deer & elk | Winter | South and west facing slopes and in the bottoms along the Coeur d'Alene River | Increased browse production<br>Removal of thermal cover<br>Increased vehicular access and harrassment<br>Increased harvest pressure |
| | | Black bear and mountain lion | year-round | Potential habitat throughout the area | Potential displacement<br>Increased harvest pressure<br>Increased vehicular access<br>Decreased area for spatial mobility (home range for males is about 12 square miles) |
| | | Waterfowl | | Along tributaries of Coeur d'Alene River | No key waterfowl areas are expected to be impacted |

TABLE 9.4-37 CULTURAL RESOURCES SITES

| State County | Site Number | Site Name | National Register | Site Type | Location by Pipeline Mile |
|---|---|---|---|---|---|
| Idaho | | | | | |
| Shoshone | 10SE206 | Linfor Townsite | No | Early 20th Century town | 5 |
| | — | — | No | Historic structure | 10 |
| | — | Spring Creek Administrative Site | No | Forest service history | 10 |
| | — | — | No | Historic structure | 11 |
| | — | — | No | 3 historic structures | 12 |
| | — | — | No | Historic structure | 12 |
| | — | — | No | 2 historic structures | 12 |
| | — | Graham Creek Ranger Station | No | Forest service history | 12 |
| | — | — | No | Historic structures | 14 |
| | 10SE1 | Chinese ovens | No | | 14 |
| | — | Big Jam Administrative Site | No | Forest service history | 14 |
| | — | — | No | Historic structure | 21 |

### Visual Resources

This route entails 12 crossings of the Coeur d'Alene River. This is accomplished by following the Coeur d'Alene River route, but placing the alignment in gullies and on the hillsides of this forested, scenic, and visually sensitive area. The 90-foot wide right-of-way required for construction would require cuts and fills, construction roads, plus block valve sites. Even using the minimal width of 50 feet for the right-of-way, cut and fill slopes and the 30x60 foot cleared areas for the block valve sites, the resulting impacts created by the exposed areas as seen from the state secondary highway that traverses the bottom, somewhat paralleling the proposed pipeline route, would exceed the Visual Resource Management Objectives for Class II and III, and hence, constitute a severe adverse visual impact. This would persist many years beyond the life of the project.

Abandonment involves removal of the pipeline, block valves, and ancillary equipment; cosmetically recontouring the cuts and fills to blend with existing landform, seeding, and planting to endemic vegetation. A minimum of 20 years would be required for regrowth to return this section to Class II.

### Land Use

The impacts to land use would not be significantly different from those described in chapter 3. Although less productive forest lands would be lost (U.S. Forest Service 1978), more intensive agricultural, recreational and residential uses along the river would be disturbed.

### Transportation and Utility Networks

Although there would be several additional road crossings, traffic disruptions during construction would probably be similar to those described for the proposed route in chapter 3, or only slightly more since about 14 miles (55 percent) of the construction activity would be away from public roads.

Likewise, there would be more likelihood of construction caused damage to the Yellowstone petroleum products pipeline which is paralleled for about 7 miles. Impacts to electric power supplies and systems should be essentially the same.

### Recreation

Degradation of portions of the Coeur d'Alene River resulting from pipeline crossings and possible pipeline ruptures would affect all water related recreational activities for the short term. Fishing success and desirability in the Coeur d'Alene River and tributaries would be impacted during the construction and abandonment phases.

In addition picnicking, considered one of the most popular recreational activities in Idaho (Bureau of Outdoor Recreation 1973), together with pleasure driving, and berry picking would be directly impacted by the loss of favorite roadside stops and the general disturbed, noisy, and congested conditions along the construction route. These impacts in some areas would continue until vegetation was reestablished; in other scenic areas, the visual and vegetative loss or change would be permanent, and these activities would no longer occur. Construction trucks and activities would diminish the quality and use of the Coeur d'Alene River road which is considered a scenic travelway by the U.S. Forest Service.

The attractiveness of the pipeline corridor to off road recreational vehicles would encourage additional use and possibly affect other recreational users. Due to the high recreational use of the river corridor, this alternate route segment would affect significantly greater numbers of recreationists than the proposed route. See Map Addendum for locations of area recreational resources.

### Social and Economic Conditions

Counties affected by this alternative would include Kootenai and Shoshone in Idaho. The impacts would be similar to those resulting from the Coeur d'Alene River Alternative. A discussion of those impacts is found in chapter 3.

Impacts on population, housing, and community infrastructures would be low and short-term, ending when the construction was complete. Fire departments are largely volunteer and would be strained if a major fire were to occur. Beneficial impacts would result from increased assessed valuation and property taxes.

## DRIVEWAY RIDGE, MT.

The Driveway Ridge route segment represents an alternative to the Prospect Creek proposed route between Thompson Pass and Thompson Falls, Montana (figure 9.4-11).

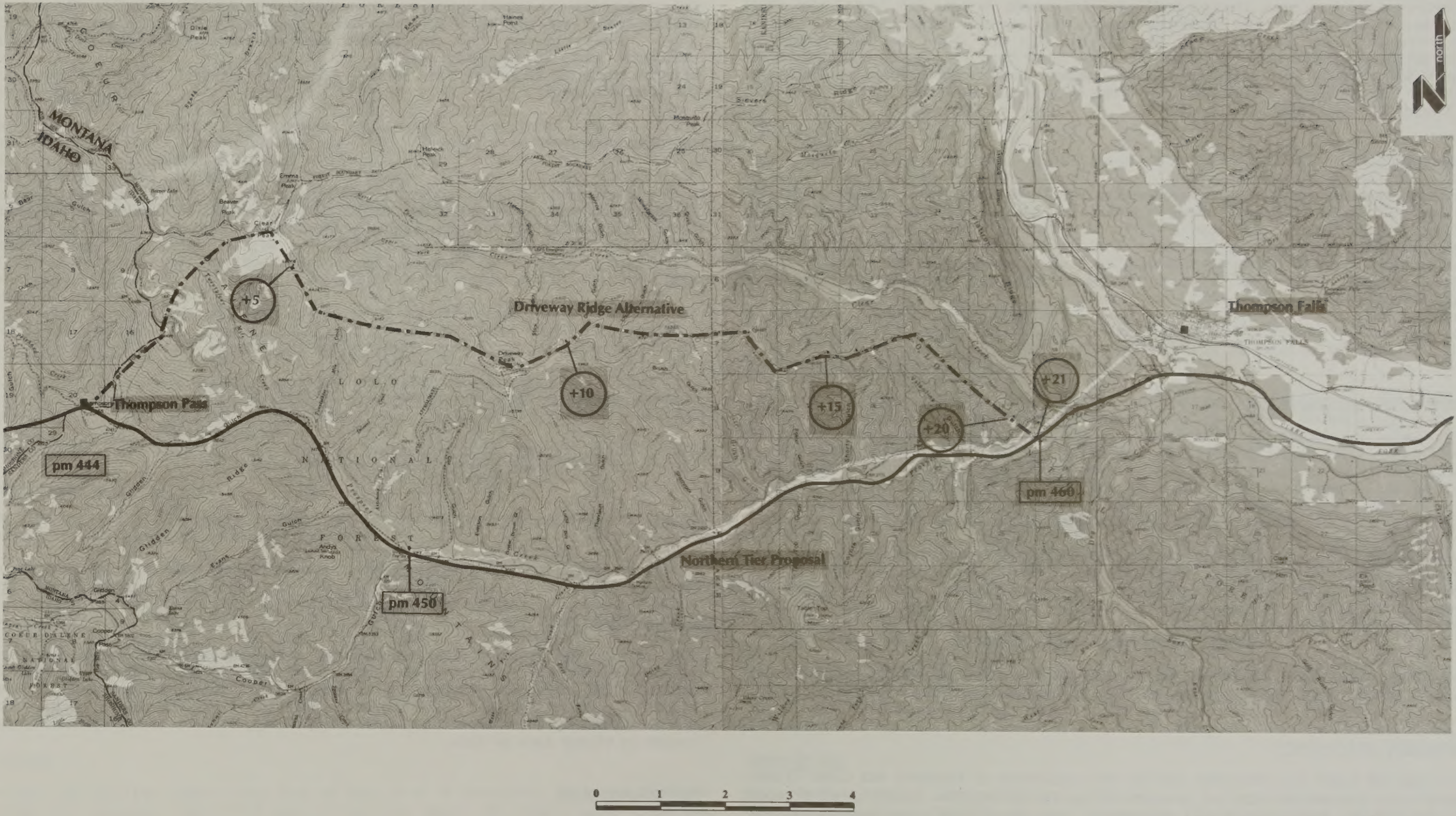


Figure 9.4-11

Northern Tier Pipeline Company

Driveway Ridge
Route Segment Alternative

This alternative departs from the proposed route (pipeline mile 444.2) near Thompson Pass, follows up a ridge northward, and then east along Driveway Ridge along Forest Service Road No. 7649. The firebreak (that extends east from the road) along Driveway Ridge has been cleared and widened from 90 feet to 200 feet for a total distance of 6.0 miles. The route then continues along the ridge top and descends to the Prospect Creek proposed route at pipeline mile 460 above the Clear Creek and Prospect Creek confluence. The Driveway Ridge route lies entirely on National Forest System land and is 20.6 miles long. The Prospect Creek route crossed 13.0 miles of National Forest System land and 3.4 miles on private and state land for a total distance of 16.4 miles.

## Description

This alternative starts at Thompson Pass on the Idaho-Montana border. From there it follows the state line north about 3.5 miles to the head of Twenty Four Mile Creek climbing 1,600 feet in the first 2 miles. Then the route turns east crossing Beaver Peak and then following the gradually descending Driveway Ridge to a point about 1 mile above the confluence of Prospect Creek and Clear Creek. Then the route turns south, dropping 1,400 feet in about 1 mile and rejoins the Prospect Creek route at pipeline mile 460.

The approximate length of this alternative is 20 miles, while the Prospect Creek segment which it replaces is 16 miles long.

## Climate and Air Quality

No impacts on climate are anticipated. Air quality impacts for this alternative would not differ significantly from those of the original proposal described in Chapter 3.

## Noise

This alternative would probably require an additional pumping station which would have an operating noise level of 69 dBA at 100 feet (approximately equivalent to the noise level experienced by a pedestrian on a city sidewalk when a car passes by). However, the pumping station would be in a remote location where very few people would normally hear it.

The impact of construction noise would be reduced because this segment would be built along a remote ridge top mostly two to three miles from the nearest house.

## Topography and Geology

The proposed route from Thompson Pass to the confluence of Prospect and Clear Creeks, would cross the valley floor of Prospect Creek (including five crossings of Prospect Creek and seven crossings of side drainages) compared to this route segment alternative which would be entirely on high ground with no drainage crossings. Since no river or stream crossings would be involved, topographic impacts along this route segment alternative would consist of widening of existing roads and trails and construction of about 2.5 miles of new road. Overall, topographic impacts would be less on this alternative route than on the proposed route.

The proposed route would cross easily excavated Quaternary alluvium whereas this route segment alternative would cross hard Precambrian sedimentary/metasedimentary rocks. While blasting would be required along portions of the route, most of the excavation would be generally limited to a 8 x 5-1/2-foot trench. As excavation in alluvial material requires wider trench walls, more material would be removed along the proposed route.

### Geologic Hazards

Both routes are located in an area of moderate seismic activity, corresponding to a Seismic Risk Zone 2 (moderate earthquake damage expected). However, neither route would encounter active or potentially active faults, nor have any large magnitude earthquakes (6+ on the Richter scale) occured within 100 miles of either route. Consequently, anticipated impacts from seismic activity are expected to be the same.

As potential slope instability has been identified along the proposed route and no problems have been identified along this route segment alternative, anticipated impacts are expected to be much greater along the proposed route.

### Mineral Resources

There is insufficient data concerning mineral resources along this route segment alternative to compare impacts to the proposed route.

## Soils

Throughout its length the proposed route between Thompson Pass and the confluence of Prospect and Clear Creeks, lies in deep, well-drained soils described as gravelly, sandy and loamy. Erosion hazard is low because of the gentle slopes and nature of the soil material.

The Driveway Ridge Route passes through well-drained, permeable soils with low to moderate erosion potential, except occasional areas having a highly erodable ash mantle. Slump hazard ranges from low to moderate, with the greatest potential on the slope above Thompson Pass. Here the route parallels a snow avalanche chute. There may be a tendency for a backfill of moderately slumpy soil to move downward along the trench on slopes such as this.

## Aquatic Resources

The five crossings of Prospect Creek on the proposed route would produce silt which would temporarily lower water quality and adversely impact fish spawning beds. The alluvial deposits in the valley bottom are major aquifers. Trenching may change subsurface water flow.

The Driveway Ridge alternative has no creek crossings and crosses no aquifers. Some silt might reach the streams from this route but it would be much less than that resulting from construction along Prospect Creek.

### Terrestrial Vegetation

The proposed route parallels a road and three power lines which require timber-free rights-of-way. If the pipeline can share at least a portion of the cleared right-of-way, the impact on timber production would be considerably less than a route crossing land devoted primarily to timber production. Additionally, the proposed route crosses more than 3 miles of private land used for agriculture or subdivided for homesites. The combination of these factors could result in the long-term removal of more than twice as much land from timber production on the Driveway Ridge alternative.

Vegetation, other than trees, could generally be restored within one year after construction.

### Terrestrial Wildlife

Because the right-of-way would be kept free of tall trees, there is a potential for a long-term increase in forage production as vegetation becomes reestablished after construction. The Driveway Ridge route could have a greater beneficial effect because of its more remote location.

### Cultural Resources

The area crossed by this route segment alternative has not been investigated for the purpose of identifying cultural resource sites.

### Visual Resources

The proposed route follows the highway along Prospect Creek, while the Driveway Ridge alternative is generally out of sight from the road. Conversely, a buried pipeline in the alluvium along the valley floor would not be obvious once vegetation has been reestablished because there are several rights-of-way in the valley bottom and the entire corridor would be kept free of trees. On the other hand, the Driveway Ridge alternative would remain visible as a treeless corridor specifically where it enters the valley.

### Land Use

Because the pipeline right-of-way must be kept free of structures such as houses and barns, the proposed route would have a definite impact on future subdivision and construction along the valley floor. The Driveway Ridge has no forseeable potential for such development, and thus its primary land-use impact would result from the requirement that the corridor be kept free of trees.

### Transportation and Utility Networks

Much of the proposed route is already occupied by a highway, several electric power and telephone lines and a petroleum products pipeline. Relocation of existing facilities might be required and obstruction of traffic during construction could be expected.

No utilities are located on the Driveway Ridge alternative.

### Recreation

The short-term impact of the proposed route is potentially great. The presence of an 8-foot-deep trench, a line of 42-inch pipe being assembled by up to 100 workers operating a variety of large machines would temporarily interrupt most recreational activities in the valley.

Construction clearing, noise, and activity would reduce big game hunting success until suitable browse vegetation and cover had returned (1 to 3 years). The corridor and access roads would attract offroad vehicle use.

This alternate would impact fewer recreationists as compared to the proposed segment.

### Social and Economic Conditions

As mentioned under land Use, the proposed route along Prospect Creek could have a negative impact on land subdivision for residential use because no buildings would be allowed on the right-of-way.

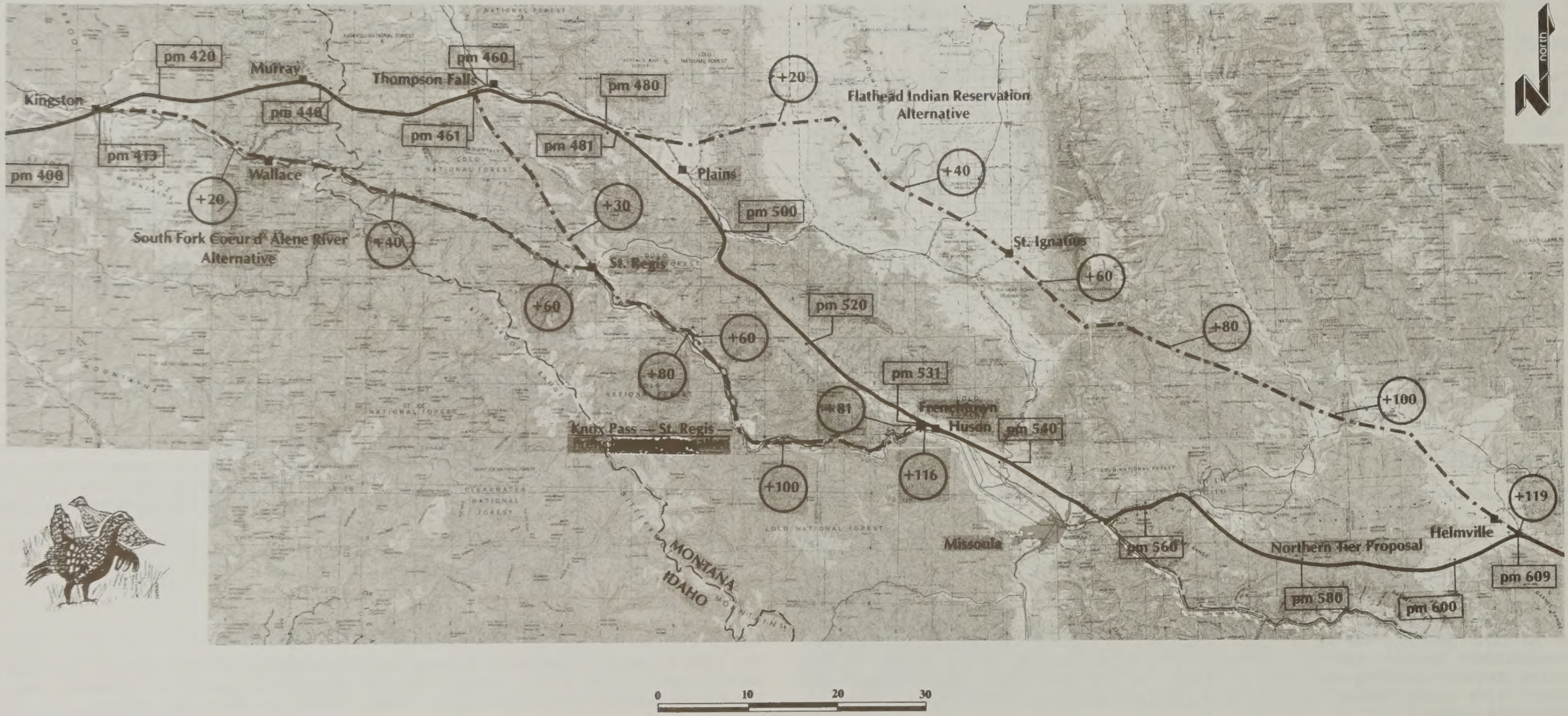
The Driveway Ridge route would have a small economic impact by virtue of the removal of about 6 acres from timber production per mile where the route passes through land currently devoted to timber production. Where the route follows existing trails and roads the loss of timber production attributable to the pipeline would be negligible.

## FLATHEAD INDIAN RESERVATION, MONTANA

The NTPC originally proposed to cross the Flathead Indian Reservation. Refusal by the Flathead Indian Tribal council required the NTPC to change the proposed route to the Siegel Creek-Ninemile Creek area between Plains and Missoula, Montana.

### Description

The Flathead Indian Reservation route begins west of Plains, Montana, in Sanders County at pipeline mile 481 and goes east across the Flathead Indian Reservation to Helmville, Montana (figure 9.4-12). The route crosses state highway 28 and then crosses the western boundary of the Flathead Indian Reservation below Rainbow Lake. Continuing east and then southeast the route crosses state highway 382; parallels



Flathead Indian Reservation • Knox Pass – St. Regis – Missoula •
SouthFork Coeur d'Alene River

Route Segment Alternatives

Figure 9.4-12

Northern Tier Pipeline Company

a powerline, then crosses the Flathead River, the Burlington Northern Railroad and state highway 93 near Saint Ignatius, Montana, the route crosses the east boundary of the Flathead Indian Reservation in Missoula County, continues southeast to a point west of Nevada Lake joining the proposed route at pipeline mile 609. Total distance of this route segment is 119 miles compared to 128 miles for the proposed route.

## Climate

No significant impacts on climte would be anticipated.

## Air Quality

Air quality impacts during construction would be about the same as those for the proposed route. Existing air qualiy levels along this alternate route may be somewhat better than along the proposed route. Fewer residential areas exist along the alternate route so that a smaller population would be potentially affected. Air quality impacts during operation would be negligible.

## Noise

Noise levels during construction would be about the same as those for the proposed route. Fewer residences would be affected than would be the case for the proposed route. No significant noise levels would be associated with the operation phase.

## Topography and Geology

This route segment alternate would cross terrain characterized by moderately rugged mountain foothills and rolling hills flanked by broad alluvial and/or glacial valleys. While somewhat similar to the proposed route in the area (Plains to Helmville--pipeline mile 481 to 609), the average slope is somewhat gentler (12 percent) than the proposed route (18 percent). Consequently, the topographic impacts, consisting primarily of minor landform changes would be less severe (about 8 percent less alteration per mile) than the proposed route.

This route segment alternate would, like the proposed route, cross Precambrian sedimentary/metasedimentary rocks as well as Quaternary glacial and alluvial deposits. Consequently, the impacts to the geologic material would be similar, consisting primarily of the removal and replacement of large volumes of geologic material and some blast and/or excavation-induced changes in the physical characteristics of the geologic material (e.g., cementation, inherent rock strength, porosity, permeability). However, as the average slope along the route segment alternative is about 6 percent less than the proposed route there would be about 40 percent less rock removed during excavation, resulting in a lower impact.

### Geologic Hazards

Geologic hazards that could be encountered along this route segment alternative would be much the same as those that could be encountered by the proposed route in this region and would consist of seismicity and slope instability.

Like the proposed route, this route segment alternative would be located in an area of moderate seismic activity that has been classified by the 1976 Uniform Building Code as a Seismic Risk Zone 2 (moderate earthquake damage expected). Since both routes have experienced similar levels of earthquake activity, the impacts resulting from ground shaking should be approximately the same. Slopes along this route segment alternative are somewhat gentler than along the proposed route so that impacts resulting from liquefaction of bearing sediments, which could occur along the Clarks Fork and Flathead Rivers, should be lower. Four potentially active surface fault ruptures (i.e., faults showing apparent movement within the past 2 to 3 million years) have been identified along this portion of the proposed route, two of which would be crossed (one along Siegel Creek and one east of Missoula). No known potentially active faults have been identified along this route segment alternative. Consequently the anticipated impacts resulting from surface fault movement would be much lower along this route segment alternative.

Although slope instability has been identified along this route segment alternative (route segment pipeline mile +5, +89, +91, +99), the overall slopes are gentler than along the proposed route in this area and should result in lower impacts.

### Mineral Resources

Unlike the proposed route in this area which would interfere with mineral recovery operations along St. Louis Creek (pipeline mile 507) and possibly interfere with gold placer operations along Ninemile Creek (pipeline mile 508 to 515), the route segment alternative would interfere with no known mineral recovery operations. Consequently, the overall impacts on mineral resources would be substantially lower.

## Soils

From Plains the route would extend approximately 35 miles eastward through both alluvial and mountainous soils. From the Flathead River the route would traverse southeastward about 17 miles through soils of Jocko, Moiese, Gird, Tally, Round Butte, Lambeth, Irvine, Post, and Ronsan series. These are well drained, moderately permeable soils occurring on nearly level to sloping topography. The route would continue about 35 miles through soils of Molman, Felan, Winkler, Sharrott, and Holloway series. These are sloping to steep, shallow to deep, loamy forested soils. On crossing the Clearwater River and Blanchard Flat the route would traverse soils of Totelake, Martinsdale, and Holloway series. These are sloping to steep, moderately deep loamy soils. The remaining part of the route to Helmville would parallel Blackfoot River Valley through soils of unknown series. Topography is nearly level for the most part and soils are poorly drained and loamy textured.

Construction activities along the 119-mile route segment alternative would disturb soils on about 1,450 acres as compared to 1,550 acres for the proposed route segment. Potentially significant water erosion impacts would occur along a total of 30 miles in six separate areas. Present soil losses of less than two tons per acre per year with protective vegetation would increase to as much as 15 to 20 tons per acre after vegetation has been removed. This loss rate would continue at a decreasing rate in relation to the increase in vegetation and would return to near normal in 2 or 3 years. Erosion loss comparisons cannot be made between this route segment and the proposed segment due to insufficient base data.

Other soil impacts would be similar to those on the primary route.

Aquatic Resources

### Physical Components

The largest streams crossed along this route segment would be: Clark Fork River, Little Bitterroot River (2 crossings), Flathead River, Jocko River, Placid Creek, and Blackfoot River. All are tributary to the Clark Fork River. Numerous smaller streams would also be crossed. Water quality and discharge data has not been identified for streams along the route. Groundwater resource information has not been identified along this route.

Construction of the pipeline under the streambed would disturb sediments which would temporarly degrade water quality downstream from the crossing in all streams. Erosion from streambanks could contribute sediment to streams during construction and into the operation phase until revegetation occurs. An oil spill would degrade water quality for several miles downstream from the spill site. Impacts on surface water resources along this route segment would likely be less significant since fewer streams would be crossed than along the proposed route.

### Biological Components

Fisheries resources have not been identified in detail along this route segment, however, most streams likely support one or more trout species. In addition, the Clark Fork, and Flathead Rivers support Northern Pike. Nearly all streams probably support forage fish such as minnows and sculpins.

Construction in the streambed and erosion from the streambank would contribute sediments which could damage trout spawning areas and reduce trout populations. Streambank erosion could continue during the operation phase until vegetation becomes reestablished. Since spawning areas have not been identified, it is not known to what extent trout populations would be reduced An oil spill could reduce fish and aquatic insect populations for many miles down stream from the spill site. Recovery of reduced fish population resulting from sedimentation or an oil spill could take several years. Impacts on fisheries resources along this route segment would likely be less significant than those along the proposed route, since fewer streams supporting fisheries resources would be crossed.

Terrestrial Vegetation

The route parallels an existing utility corridor from north of Plains to Rainbow Lake through mostly western ponderosa pine forest. This vegetative community is dependent upon moisture concentrated at outcropings of sandstone or shale layers. Disturbance of these substrates could inhibit or prevent reestablishment of the ponderosa pine community.

At the higher elevations between Plains and Rainbow Lake along the flat dry ridges the following vegetative types are common: subalpine fir/beargrass; subalpine fir/grouse whortleberry; and mountain hemlock/beargrass. Summer forage is low and wildlife winter forage are very low. Timber production and regeneration is low. Reduction of timber stands would probably be permanent.

Plant communities between Rainbow Lake and the Flathead River are principally intermountain valley grasslands and meadows and rangeland characterized by bluebunch wheatgrass and fescue. A major portion of this segment also parallels an existing utility corridor. The proposed route would require additional acreage resulting in an expanded corridor and increased assessibility into the area. Removal of the ground cover and shade plants especially at stream crossings or along the riparian zone of Wilkes Gulch, Little Bitterroot, and Flathead Rivers would cause increased evapotranspiration, erosion, and soil compaction preventing seedling establishment. Grazing or high utilization of the corridor by recreationists and/or wildlife would increase these impacts.

Riparian habitat along the Clearwater, Blackfoot, and Flathead Rivers consists mostly of cottonwood-willow-dogwood types. Douglas-fir is not uncommon in these areas and sometimes dominates the river's edge. Removal of this old growth habitat would impact nesting habitat for raptors and shorebirds and permanently alter the vegetative composition.

The dominant communities between the Flathead River and St. Ignatius are cottonwood-willow-dogwood; bluebunch wheatgrass-fescue; and Douglas-fir. Impacts in this area would disturb riparian habitat and grazing areas associated with Sabine, Mission, and Deep Creek. Reduction of berry bushes and abundant shrub growth would reduce spring forage for bear and deer.

The corridor follows the foothills of Garnet Range and lower elevations of tributaries draining into Nevada Creek. From the Blackfoot River to Helena the dominant vegetation is Douglas-fir-lodgepole pine and Douglas-fir-western ponderosa pine. Reduction of old growth habitat would occur.

Terrestrial Wildlife

The greatest impacts from this route include: 1) increased accessibility to large undisturbed areas, and 2) loss of riparian and winter areas. Habitat for species requiring large spatial distances, i.e. the grizzly bear, would be reduced by increased human disturbance, recreation, and hunting. Wintering ranges used by elk, and deer would be reduced especially along narrow riparian zones, of intermittent and permanent streams. Where the riparian habitat has a disproportionately high use by wildlife, or provides a migration route, long term impacts would result from relatively small alterations and disturbance. The greatest diversity and abundance of wildlife would be impacted along the Flathead River and associated tributaries. Travel corridors and foraging areas used by grizzly bear would be disturbed near Post and Placid Creeks. Disturbance and reduction of old growth habitat could affect bald eagles and other raptors. In comparison most of the impacts resulting from the proposed Ninemile Creek route occur along riparian zones intensively used by wildlife. The diversity and abundance of wildlife in these narrow streamside corridors would be more severely impacted because of habitat reduction. Table 9.4-38 describes short and long term impacts to wildlife. Table 9.4-39 describes anticipated impacts to threatened and endangered species.

TABLE 9.4-38 TERRESTRIAL WILDLIFE ALONG FLATHEAD ALTERNATIVE

| Area/State | Species | Long-Term Impacts | Short-Term Impacts |
|---|---|---|---|
| Rainbow Lake | White-tailed deer, elk and moose<br>Winter habitat north of Rainbow Lake | Increased assessibility to hunting, poaching, recreation and develment pressures | Reduction of limited wintering areas, thermal cover and browse along riparian zone |
| Little Bitterroot River | Important winter habitat for mule deer extends from Wilkes Gulch to Camas Prairie along tributary streams of Little Bitterroot River | Increased assessibility to hunting, poaching, recreation and development pressures | |
| | Pheasant and hungarian partridge habitat along streambottom | Increased assessibility to hunting, poaching, recreation and development pressures | Reduction of lower shrub understory and 1 year's production of young |
| Flathead River | Abundant wildlife habitat along riparian zone for raptors, shorebirds, elk and black bear<br>Islands provide fawning areas for white-tailed deer and nesting grounds for waterfowl and Canadian geese | Removal of fawning and nesting areas and reduction of habitat within the limited riparian zone<br>Removal of old growth habitat for raptors | Disturbance of at least one year's production of waterfowl and big game |
| Montana National Bison Range | Route passes north of the NWR administered by USFWS for bison and other big-game animals | Increased availabliity to human disturbance, harrassment and noise | Disturbance and alteration of forage and browse could result from an oil spill |

TABLE 9.4-38 (Continued)

| Area/State | Species | Long-Term Impacts | Short-Term Impacts |
|---|---|---|---|
| St. Ignatius to South Fork of Jocko River | Migration route bridging important elk winter and summer ranges | Reduction of limited winter range and increased accessibility to hunting, poaching, recreation and development | Vegetation removal would temporarily decrease available browse and thermal cover |
| Placid Lake | Elk calving and winter range | Reduction of limited winter range and increased accessibility to hunting, poaching, recreation and development | Vegetation removal would temporarily decrease available browse and thermal cover |
| Clearwater Lake | Elk and deer winter range | Reduction of limited winter range and increased accessibillity to hunting, poaching, recreation and development | Vegetation removal would temporarily decrease available browse and thermal cover |
| Blackfoot River to Nevada Creek | Elk and deer winter range and calving areas for elk | Reduction of limited winter range and increased accessibility to hunting, poaching, recreation, and development | Vegetation removal would temporarily decrease available browse and thermal cover |

Mule deer

U.S. Fish and Wildlife Service

TABLE 9.4-39 THREATENED AND ENDANGERED SPECIES ALONG FLATHEAD ALTERNATIVE

| Species | Location | Existing Habitat | Long-Term Impacts | Short-Term Impacts |
|---|---|---|---|---|
| Bald Eagles | Flathead River | Wintering bald eagles feed along the Flathead River.<br>The area has high potential for nest sites | Removal of old growth habitat and increased accessibility to human disturbance.<br>Oil spill potential along the river could reduce bald eagle populations | Reduction and disturbance of feeding and scavenging areas |
| Grizzly Bear | Post Creek | Travel corridor used by grizzly moving from Mission Range to feeding grounds along lower tributaries | Incerased accessibilityity to hunting, poaching, recreation and development pressures<br>Reduction of large areas required by the grizzly bear | Reduction of foraging areas and travel corridors |
| | Jocko River | Grizzly habitat 4-5 miles north of Middle Fork Jocko River | Increased accessibility to hunting, poaching, recreation and development pressures<br>Reduction of large areas required by the grizzly bear | Reduction of foraging areas and travel corridors |
| Grizzly Bear (Cont.) | Placid Creek | Grizzlies forage along subalpine ridges southeast of Placid Lake and along Placid Creek | Increased accessibility to hunting, poaching, recreation and development pressures<br>Reduction of large areas required by the grizzly bear | Reduction of foraging areas and travel corridors |
| Bald Eagles | Placid Lake | Breeding bald eagles may occur between Placid Lake and Clearwater River | Removal of old growth habitat could reduce availability of nesting sites | Reduction and disturbance of scavenging and feeding areas |
| | Clearwater | Nesting eagles 2 miles from route | Increased accessibility to human disturbance might cause abandonment of the nesting sites | Reduction of at least one year's productions of young |
| | Blackfoot River | Nesting eagles 2 miles from route | | |

Grizzly bear with cubs

U.S. Fish and Wildlife Service

## Cultural Resources

The cultural resource sites listed below would potentially be affected if this route segment alternative is followed. There is high potential for the discovery of additional archaeological and historical sites along this alternative route alignment. The pipeline miles listed in the table have been measured from the place north of Plains, Montana, where this alternative leaves NTPC's proposed route (pipeline mile 481 of the proposed route).

TABLE 9.4-40 CULTURAL RESOURCE SITES, FLATHEAD ALTERNATIVE

| State/ County | Site Number | Site Name | National Register | Site Type | Location by Pipeline Mile |
|---|---|---|---|---|---|
| Montana | | | | | |
| Sanders | 24SA1099 | — | No | Pictographs | 3 |
| | 24SA115 | — | No | Campsite | 5 |
| | 24SA1060 | — | No | Occupation | 28 |
| | 24SA1059 | — | No | Occupation | 28 |
| | 24SA1058 | — | No | Occupation | 29 |
| | 24SA1057 | — | No | Occupation | 29 |
| | 24SA1056 | — | No | Occupation | 29 |
| | 24SA1055 | — | No | Occupation | 29 |
| | 24SA1054 | — | No | Occupation | 29 |
| | 24SA1052 | — | No | Occupation | 30 |
| | 24SA1051 | — | No | Occupation | 30 |
| | 24SA1050 | — | No | Occupation | 31 |
| | 24SA1049 | — | No | Occupation | 33 |
| | 24SA1048 | — | No | Occupation | 31 |
| | 24SA1047 | — | No | Occupation | 31 |
| | 24SA1046 | — | No | Occupation | 32 |
| | 24SA1045 | — | No | Occupation | 33 |
| | 24SA1044 | — | No | Occupation | 33 |
| | 24SA1040 | — | No | Occupation | 33 |
| | 24SA1041 | — | No | Occupation | 34 |
| Lake | 24LA501 | Bone yard site | No | Occupation | 43 |
| | 24LA502 | Boundary site | No | Occupation | 45 |
| | — | St. Ignatius Mission | Yes | Mid- to Late 19th century Jesuit mission, school to Native Americans | 53 |
| Missoula | 24MO701 | — | No | Occupation | 91 |
| | 24MO506 | — | No | Occupation | 91 |
| Powell | 24PW1068 | North Fork bridge site | No | Occupation | 106 |
| | 24PW104 | Montour grave | No | ? | 106 |

TABLE 9.4-40 (Continued)

| State/ County | Site Number | Site Name | National Register | Site Type | Location by Pipeline Mile |
|---|---|---|---|---|---|
| Montana | | | | | |
| Powell (cont.) | 24PW105 | — | No | Scarred trees | 108 |
| | 24PW1067 | — | No | Occupation | 100 |
| | — | Lewis and Clark Trail National Historic Trail | | Early 19th century exploration rt. | 112 |
| | 24PW1066 | — | No | Occupation | 112 |
| | 24PW1072 | — | No | Occupation | 112 |
| | 24PW1071 | — | No | Occupation | 112 |
| | 24PW1059 | — | No | Occupation | 113 |
| | 24PW1074 | — | No | Occupation | 113 |
| | 24PW1062 | — | No | Occupation and possible bison jump | 116 |

There are no currently known paleontological localities along this route segment alternative. The only deposits along the route which have been identified as having potential for containing fossils are fairly extensive Quaternary deposits of glacial drift and lake deposits and alluvium. Fossil materials in these deposits would also have the potential of being associated with prehistoric archaeological material.

Potential impacts to these sites and to any presently unrecorded sites would be the same as those discussed in Chapter 3.

## Visual Resources

The Plains to Helmville alternative route traverses low foothills and rolling hills, and pipeline construction would be relatively simple. This is in sharp contrast to the proposed route that traverses the steep slopes of the scenic Siegel, Ninemile area where installation of the pipeline would cause extensive visual impact.

## Land Use

In Montana the pipeline corridor would cross the Flathead Indian Reservation for a distance of about 60 miles. Land within the reservation includes non-Native American-owned, tribal lands as well as those owned by individual Native Americans. Significant land uses include irrigated and nonirrigated croplands, forest land, and rangeland. The small towns of Moiese and St. Ignatius are within the corridor.

Construction would affect approximately 735 acres within the Flathead Reservation in Montana. Across the Flathead Reservation, construction of pipeline right-of-way and pump stations would impact approximately 235 acres of agricultural, 245 acres of forest, and 255 acres of rangeland.

The pipeline route could impact the Blackfoot River Corridor, a scenic/recreation corridor in western Montana.

## Transportation and Utility Networks

Impacts due to construction, operation, and in the event of an oil spill would be similar to those discussed in the transportation and utility section of chapter 3.

## Recreation

Recreational use and attractiveness of use occurring along this alternate route segment is much greater and more intensive than use occurring along the preferred NTPC route. The major emphasis is for water related activities and hunting. In general, hunting opportunities and potential impacts are similar. However, fishing pressure is greater along this route segment with principal sport fisheries found along the Little Bitterroot, Flathead, Jocko, and Blackfoot Rivers. Placid Lake sustains high fishery and dispersed day recreational use; the proposed pipeline would traverse the southern shoreline.

The area between the Clearwater River and Helmville is heavily utilized as a recreation resource. Numerous campgrounds, and small lakes are found in the vicinity. In addition, the Blackfoot River Corridor between Johnsrud Park and Cottonwood Creek is in the process of being acquired by the Nature Conservancy to be managed for recreation and scenic values. A recently concluded agreement gives the Montana Department of Fish and Game recreational management control for 5 years. Area hunting, river fishing, float boating, and other day and camp uses attracted about 26,000 visits in 1978. An estimated 10 percent increase in use is occurring each year with most of the use between May and September. The proposed corridor would cross The Blackfoot River near Cottonwood Creek, which is 30 miles upstream from Johnsrud Park.

The recently designated Lewis and Clark National Historic Trail also follows the Blackfoot River and is crossed twice by this route segment. The intent of the National Trail System is to preserve the historic or scenic character of the designated trail.

Crossing the Blackfoot River would temporarily disrupt recreational uses and reduce the areas' high scenic value for the life of tne project. A pipeline leak or rupture at the Blackfoot River crossing could contaminate river banks and citically impact conservation easement areas downstream.

## Social Conditions

### Population

The Flathead Reservation occupies portions of four counties: Flathead, Lake, Missoula, and Sanders. Increases in the population during construction and operation phases are not significant. Population increases on Reservation lands would be minimal.

### Infrastructure

No impacts would be expected to occur on the infrastructure components of the Flathead Reservation during the construction and operation phases of this alternative.

### Social Well-Being and Quality of Life

Implementation of this alternative would have significant adverse impacts on the social well-being and quality of life indicators for residents of the Flathead Reservation. The proposed route would cross lands regarded as sacred by members of the tribal groups of the Flathead Nation. To the extent that Native American religious areas are protected by the Indian Religious Freedom bill enacted by Congress in 1978, there is a strong probability that litigation to prevent construction would be initiated by the Tribal Council. The Council already has taken a strong position opposing construction.

# KNOX PASS--ST. REGIS--FRENCHTOWN, MONTANA

The Montana Deptartment of Natural Resources proposed this route segment which leaves the proposed route near Thompson Falls and rejoins it west of Missoula. The purpose was to avoid environmental impacts and public opposition on the proposed route through the Ninemile Valley.

## Description

This route segment begins west of Thompson Falls, crosses Knox Pass on the Lolo National Forest, continues to St. Regis, then follows the Clark Fork to the proposed route west of Frenchtown (figure 9.4-12). Total distance for this route segment is 81 miles compared to 70 miles for the proposed route.

Leaving the proposed pipeline route at pipeline mile 460.5 this route travels south along Dry Creek and Knox Creek to Knox Pass. Continuing, the route follows Twelvemile Creek, the East Fork of Twelvemile Creek and Mullan Gulch to St. Regis. At this point, the route would cross Interstate Highway 90 and the St. Regis River in order to bypass southwest of the town of St. Regis. From here the route would follow the south side of the Clark Fork River, attempting to utilize County road and railroad right-of-way to Huson, Montana. Use of the entire Milwaukee Railroad right-of-way would depend upon abandonment which is presently proposed by the Chicago-Milwaukee-St. Paul-Pacific Railroad Company.

At Huson the route would continue on across the Clark Fork River, joining the proposed route at pipeline mile 531 west of Frenchtown.

Before joining the proposed route and prior to crossing the Clark Fork, this route segment crosses the Milwaukee Railroad which is the beginning of another route segment through Missoula. If the route through the city of Missoula was selected, the Knox Pass--St. Regis route segment to Huson would be about 80 miles, or 1 mile shorter than if it joined the proposed route on the north side of the river.

## Environmental Analysis

### Climate

No significant impacts on climate would be anticipated.

### Air Quality

Emissions of pollutants during construction would be about the same as those for the proposed route (see chapter 3). Air quality impacts would be about the same. No significant impacts would be expected during the operation phase.

### Noise

Noise levels during construction would be about the same as those for the proposed route (see chapter 3). A small number of residences would experience a temporary increase in noise levels. No significant noise levels would occur during the operation phase.

### Topography and Geology

This route segment alternative would cross terrain characterized by moderate to steep mountains (20 to 100 percent side slopes) and a relatively gentle (5 percent gradient), moderately broad (.25 to 2 miles wide) alluvial valley (Clark Fork River). Impacts would be similar to those that would be encountered by the proposed route (Prospect Creek to Frenchtown segment) and would consist primarily of landscape alterations resulting from construction activities. However, as the slopes along this route segment alternative are steeper than the proposed route, the resultant impacts would be somewhat greater (about 14 percent more acreage per mile would be disturbed), particularly along the mountainous northern portion (Prospect Creek to Cabin Creek) of the segment.

Geologic material that would be encountered along this route segment alternative would be essentially the same as that encountered by the proposed route, consisting primarily of Precambrian metasediments (quartzites, argillites, carbonates), Quaternary alluvium and some glacial deposits. Geologic impacts would be similar to those encountered by the proposed route and would consist of minor changes in the physical characteristics of the material resulting from construction activities, and the excavation of large volumes of geologic material. As the average slopes along this route segment alternative are greater, the volume of geologic material that would be removed would also be greater (about 60 percent) than along the proposed route.

#### Geologic Hazards

Seismicity and slope instability are the only geologic hazards that have been identified along this route segment alternative. Like the proposed route in this region, this route segment alternative is located within an area of moderate seismic activity that has been classified by the 1976 Uniform Building Code as a Seismic Risk Zone 2 (moderate earthquake damage expected). It appears that seismic levels along both routes are about the same, consequently impacts from ground shaking are expected to be the same. There is little data regarding the location of potentially active and/or active faults and liquefaction zones along this route segment. Assessment of these potential impacts is not presently possible. In like measure, there is little information pertaining to areas where slope failure could occur; consequently a comparison cannot be made of slope instability impacts to the proposed route.

#### Mineral Resources

While this route segment alternative would cross numerous mining areas, it would not directly interfere with any known mining operations. Consequently, impacts to mineral resources should be less than along the proposed route, which would interfere with a mining operation along St. Louis Creek (pipeline mile 507).

### Soils

The first 7 miles of the route segment alternative traverses stream bottoms, terraces, and low benches. Slopes are nearly level to gentle and soils are deep, gravelly, sandy, and well drained. The route over Knox Pass traverses high, gently rounded divides with slopes up to 35 percent and uniform mountain slopes with gradients of 35 to 65 percent. These mountainous soils are moderately deep to deep cobbly loams developed over argellite and quartzite. Soils of the remaining part of the route are mostly alluvial valley soils that are shallow to moderately deep and are gravelly and cobbly. About 4 miles of this route traverses glacial lakebed deposits with deep, slowly permeable, silty and clayey soils subject to seasonally high water tables.

Approximately 970 acres would be disturbed along this alternate route leaving them vulnerable to accelerated soil erosion. This compares with about 848 acres that would be disturbed along the proposed route. About 19 miles of the alternate route traverses soils on moderately steep to very steep mountainous slopes. Only about 12 miles of the proposed route segment would have similar slopes. Water erosion on these slopes could cause soil losses at rates as much as 70 tons per acre per year until vegetation is reestablished. Other soil impacts would be comparable to those of the proposed route.

### Aquatic Resources

#### Water Quality

Surface water impacts will be higher along this alternate route segment because of the amount of encroachment on streams and the number of creek crossings. Approximately 18 miles of perennial stream would be closely paralleled (immediately adjacent) and sedimentation in the streams would be greatly increased. Potential impacts on the stream channels are high. The greater amount of steep slopes located along this alternate route segment would require more earth moving for leveling a work surface and increase the potential for erosion and sedimention of streams. Ground water impacts along this route segment alternative were not assessed.

Fisheries

Impacts to the fisheries resource would be greater along this route segment alternative than along the proposed corridor. This is due to the greater number of spawning streams crossed and paralleled. Pipeline construction paralleling Dry Creek, Knox Creek and Twelvemile Creek would encroach on these streams, resulting in permanent stream course alteration, channelization, and the introduction of high sediment loads. These creeks are located in narrow, steep-sided mountain valleys with very little flat bottom land. From St. Regis to Frenchtown the route crosses many streams that provide spawning areas for the Clark Fork salmonids.

Terrestrial Wildlife

The Knox Pass -Frenchtown alternate would have slightly less impact on the wildlife resource than the proposed corridor. There would be less thermal cover loss along this alternate as much of the route would parallel existing roads. In the narrow mountain valleys cutbanks required for pipeline construction would create barriers to big game movement. Similar impacts would occur on elk summer range. Impacts to threatened and endangered species might be greater along this alternate because more essential peregrine falcon and bald eagle habitat along the Clark Fork river would be impacted. This impact could be reduced by utilizing as much of the existing road and railroad right-of-way as possible.

Cultural Resources

Given the inadequate inventory data for both the alternate and proposed corridors, it is difficult to assess the potential impacts on cultural resource sites and impossible to compare the potential impacts of the two routings. On the basis of known sites and the indicated site density along the corridors, it appears that appropriate mitigative measures (involving avoidance of sites by minor relocation of the pipeline) would be necessary for some sites in both corridors. Portions of the Mullan Road, located northwest of St. Regis, could be heavily impacted by the alternate location. National Forest management objectives along this old road are to preserve the road and to gradually convert the high density timber stands to the more open stands that existed when the road was built and used in 1860.

Visual Resources

Long-term visual impacts will be greater along this alternate because it traverses more forested land that cannot be revegetated with trees. Approximately 52 miles of the alternate is in close proximity to Interstate 90 but utilization of existing road and railroad rights-of-way would reduce impacts. Approximately 32 miles of the proposed corridor lies in close proximity to State Highway 200, which receives considerably less traffic than I-90.

Land Use

Table 9.4-41 lists the approximate miles of Federal, state and private lands crossed by this alternate, compared to the proposed route.

TABLE 9.4-41 LAND OWNERSHIP, KNOX PASS-FRENCHTOWN ALTERNATIVE

| | Knox Pass-Frenchtown Alternate | Proposed Route |
|---|---|---|
| | Miles Crossed | |
| Federal<br>(National Forest) | 28 | 17 |
| State | 4 | 5 |
| Private | 49 | 48 |
| Total | 81 | 70 |

Impacts to land use would be similar to the proposed route.

Transportation and Utility Networks

Impacts to transportation and utility facilities would be similar to those described in chapter 3. Impacts to the Chicago-Milwaukee-St. Paul Railroad would be lessened if the right-of-way is abandoned as proposed by the railroad company.

Recreation

Both the alternate route segment and proposed route have similar recreational characteristics. Impacted activities would be hunting, fishing, and driving for pleasure. This alternate would have less overall impact on recreationists due to the smaller amount of backcountry area traversed and generally wider Clark Fork River valley along this segment. If the Milwaukee Railroad right-of-way is utilized, significantly less impact to recreational uses would occur.

## SOUTH FORK COEUR D'ALENE RIVER, IDAHO--MISSOULA, MONTANA

The NTPC evaluated a possible route along the South Fork Coeur d'Alene River as an alternate to the originally proposed route along the Coeur d'Alene River. The company concluded that a route along the South Fork was not feasible (primarily due to limited available right-of-way and the high cost of construction). More specifically, the company determined that numerous mining claims, limited space in Wallace and Mullan, Idaho, and highway interruption would cause both difficult and expensive pipeline construction, therefore the company developed a proposed route from Kingston, across Jackson Ridge to Thompson Falls.

Idaho, envrionmental groups, and private citizens have requested BLM to consider an alternate route along the South Fork Coeur d'Alene River. BLM has proposed a route segment from Kingston, Idaho, paralleling the South Fork Coeur d'Alene River to Montana, along the St. Regis River to St. Regis, and then along the Clark Fork River rejoining the proposed route west of Missoula.

A more complete route segment description along with an environmental analysis comparing this alternate route segment with the proposed route follows. The analysis for this alternate is based on limited information.

### Description

This alternate would begin at pipeline mile 413 near Kingston, Idaho, follow the south side of the South Fork Coeur d'Alene River through Wallace and Mullan, Idaho (figure 9.4-12). Starting at Mullan, the potential exists for using the Burlington Northern Railroad right-of-way due to future plans for abandonment. If railroad right-of-way was available for pipeline construction, it could be used to Haugan, a distance of approximately 30 miles. From Haugan to St. Regis, the route would continue on available railroad right-of-way or be routed north from near De Boria along a county road to St. Regis. East of St. Regis, the route could follow along the south side of the Clark Fork River, crossing the river near Huson and rejoining the proposed route at pipeline mile 531, west of Frenchtown. Total distance for the route segment would be approximately 116 miles compared to 118 miles for the proposed route from Kingston to Thompson Falls, along the Clark Fork River, through the Ninemile Valley to Frenchtown, west of Missoula.

The environmental anlysis of this route segment will be summarized due to limited information available for comparison to the proposed route. Major environmental advantages would be the avoidance of impacts across National Forest lands, aquatic impacts along Prospect Creek, public opposition through Ninemile Valley and impacts to the Clark Fork River. Major disadvantages would be engineering feasibility, limited right-of-way in Wallace and Mullan, unknown public opposition and the potentially higher cost of pipeline construction. If the NTPC project were approved for construction, the final selection of the preferred pipeline route between Kingston, Idaho and Missoula, Montana warrants a complete engineering feasibility and economic study. This study should include use of the Milwaukee Railroad and a portion of the Burlington Northern Railroad rights-of-way which may be abandoned and available for the pipeline route. Therefore the feasibility of the South Fork Coeur d'Alene route segment is presented for consideration but it can only be adequately evaluated in the future, prior to NTPC construction and resolution of the railroad abandonment proposals.

## NINEMILE VALLEY, MONTANA

This alternative was proposed to reduce the mileage of the proposed route across private lands in the Ninemile Valley area between Siegel Pass and Missoula (U.S. Forest Service, Comment Letter March 1979). The following description and environmental analysis were adapted from the Environmental Assessment on the Ninemile-Frenchtown alternative prepared by the U.S. Forest Service (May 1979).

The alternate route segment for Ninemile Valley begins at Siegel Pass leaving the proposed route at pipeline mile 506, traverses Lolo National Forest land above Ninemile Creek, then rejoins the proposed route at pipeline mile 539 east of Frenchtown (figure 9.4-13). This route crosses 24.8 miles of federal and state land, and 7.4 miles of private land compared to 11.1 miles and 21.6 miles, respectively, for the proposed route. Total distance would be similar, about 32 miles for the alternate and 33 miles for the proposed route.

### Environmental Analysis

#### Climate

No significant impacts on climate would be anticipated.

#### Air Quality

Air quality impacts during construction would be about the same as those associated with the proposed route (see chapter 3). No significant impacts would be expected during the operation phase.

#### Noise

Noise levels during construction would be about the same as those for the proposed route (see chapter 3). A small number of residences would experience a temporary increase in noise levels. No significant impacts would occur during the operation phase.

#### Topography and Geology

Like the proposed route, this route segment alternative would result in relatively minor topographic impacts, primarily landscape changes and some drainage alteration. The most pronounced impacts would be along the western portion of the route, near Seigel Pass, where the route would traverse moderately steep terrain and would disturb about 18 to 20 acres per mile.

While this route segment alternative is somewhat steeper than the proposed route, the amount of land disturbed per mile is nearly identical; consequently, the topographic impacts would be essentially the same.

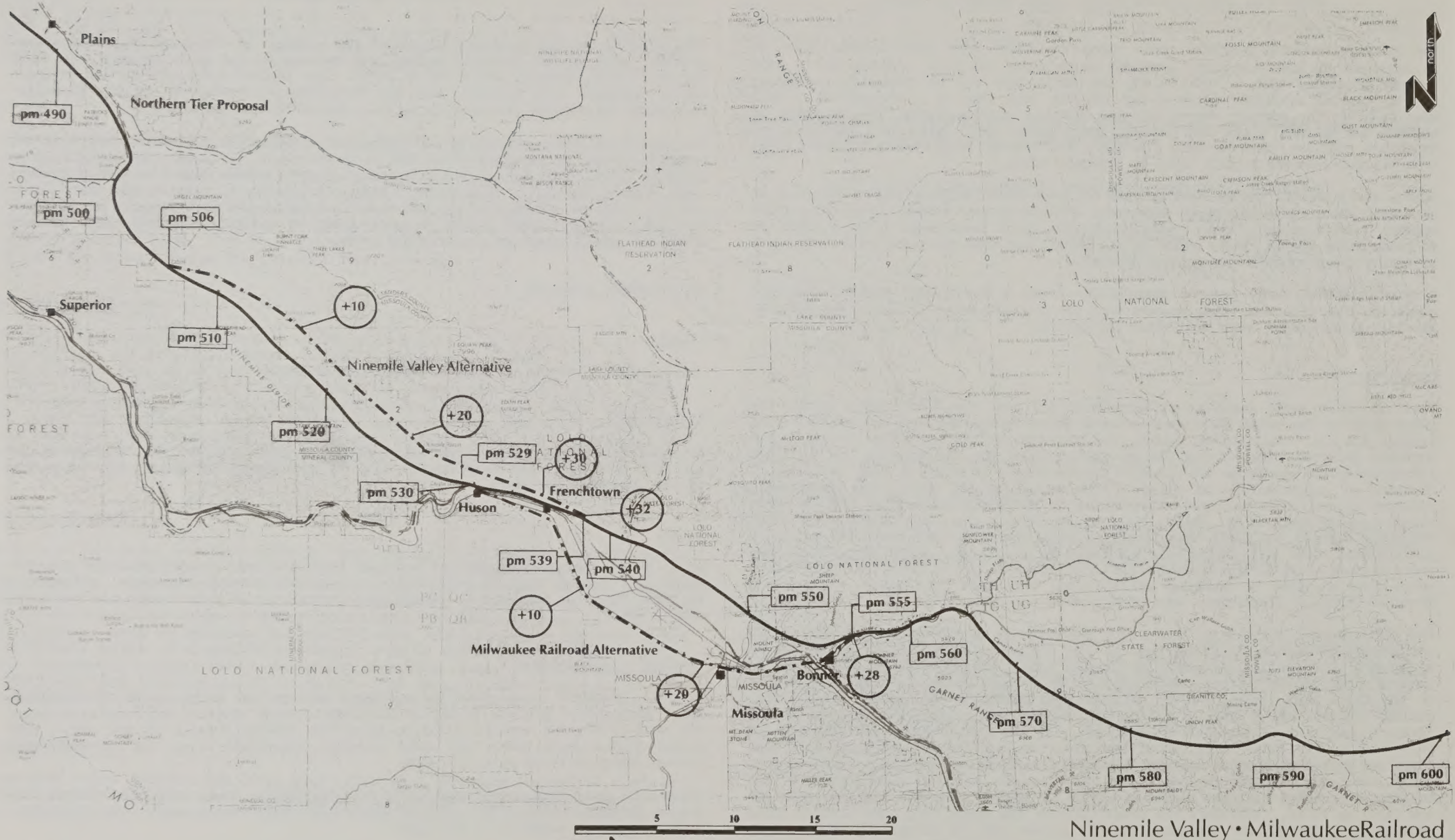


Figure 9.4-13

Northern Tier Pipeline Company

Ninemile Valley • MilwaukeeRailroad
Route Segment Alternatives

Geologic material encountered by this route segment alternative would be much the same as that encountered by the proposed route, consisting primarily of loosely consolidated Tertiary sediments and Quaternary glacial deposits. Resulting geologic impacts would be similar. They would include production of waste material unsuitable for fill and changes to rock characteristics. Since this alternative route crosses steeper terrain than the proposed route, about 26 percent more rock material would be excavated (U.S. Forest Service 1979).

### Geologic Hazards

This route alternative, like the proposed route in this area, would be within a region of moderate seismic activity classified by the 1976 Uniform Building Code as a Seismic Risk Zone 2 (moderate earthquake damage expected); it would also parallel the potentially active Ninemile fault from Siegel Pass (pipeline mile 506) to just west of O'Keefe Creek (segment pipeline mile 31.5). Consequently, seismic-related geologic hazards that could impact the proposed route would be the same. While surface movement along Ninemile fault is considered unlikely during the lifetime of the project, ground shaking could result in significant or critical impacts to the pipeline through slope failure or liquefaction of the loose sediments. Since the route alternative is situated much closer to the unstable brecciated zone along the Ninemile fault and crosses steeper terrain, seismic impacts would be significantly greater than the proposed route.

In addition to seismic related geologic hazards, slope instability problems have been identified along the entire route alternative. While both the proposed route and the alternate route would cross loose or loosely consolidated material, the route alternate would cross steeper terrain. Consequently, the impacts would be greater.

### Mineral Resources

Both the proposed route and alternate route would cross copper-silver mining claims along St. Louis Creek and several placer claims along Ninemile Creek. Consequently, impacts on mineral development would be the same.

## Soils

For the proposed route total soils impact would be about 356 acres. The alternate route would cause about 351 acres of disturbed soils.

Although the acreage of soil disturbance is similar, the impact upon soils would be greater on the alternate route where moderately sloping ground and erosive soils exist. Also, these soils are not conducive to rapid revegetation following pipeline construction.

## Aquatic Resources

### Water Quality

Water quality impacts would be greater on the alternate route than on the proposed route through Ninemile Valley. During the construction phase, greater stream sedimentation would occur, primarily due to the steeper slopes. The alternate route would have 57 crossings of intermittent and perennial streams compared to 47 for the proposed route. Combining the effects of sedimentation and the number of stream crossings, the water quality impacts would be about 1.4 to 2.0 times greater on the alternate route than on the proposed route (U.S. Forest Service May 1979).

During pipeline operation water quality impacts from potential leaks or pipe failure would be similar for both the alternative and the proposed route through Ninemile Valley. Crude oil effects upon water quality could occur for Ninemile Creek, Sixmile Creek, and possibly the Clark Fork River since both routes traverse the entire watershed.

Ground water resources are common to both the alternative and proposed routes; potential crude oil impacts are estimated to be similar.

### Fisheries

Pipeline construction and operation impacts would be greater on the proposed route rather than on the alternative. Although there would be 10 more stream crossings on the alternative route, the fishery potential is greater on the proposed route. Ninemile Creek is an important spawning and rearing stream for salmonids which provide recruitment to the Clark Fork River fishery. This higher fishery value for Ninemile Creek results in greater potential oil spill or sedimentation impacts.

Water quality impacts from sedimentation would have a proportionally greater impact on the fisheries along Ninemile Creek. This would mainly result from the lower stream gradients where sedimentation would have a greater effect. Sediments from stream crossing construction would be deposited in Ninemile Creek at a higher rate than those in streams on the alternative route along the steeper gradient. The lower stream gradients along Ninemile Creek would also have greater sedimentation impacts from lack of potential flushing.

## Terrestrial Vegetation

The proposed and alternative corridors located in the Ninemile Creek drainage traverse similar habitat groups. These groups are composed of habitat types segregated according to the physical environments they represent as determined by soil, slope, aspect, elevation, physiographic site, and climate. These factors interact to affect growing season temperatures, available moisture, and length of growing season. Group 0 (Noncommercial) is not included in the timber production base and therefore would have low impact on timber production from pipeline activities.

Group 1 (warm and dry) is characterized by open-crown ponderosa pine or Douglas-fir. Productivity is low, averaging about 3 cubic feet per acre per year with intensive management. Impacts from pipeline activities would also be low in this group.

Group 2 (moderately warm and dry) and Group 3 (moderately cool and dry) are generally dominated by Douglas-fir, with varying amounts of ponderosa pine, lodgepole pine and grand fir. Timber productivity is moderate to moderately high, averaging 70 cubic feet per acre per year under intensive management. Group 5 (cool and moderately dry) is characterized by essentially pure stands of lodgepole pine. Timber production is variable, averaging 55 cubic feet per acre per year under intensive timber management. Pipeline activities would have a medium impact on the timber productivity potential in these three groups.

Group 4 (moist) represents areas where temperature and moisture approach optimum conditions for vegetative growth within the forest community. Stand composition varies from pure spruce to mixtures of Douglas-fir, larch, grand fir, subalpine fir, hemlock and cedar. Lodgepole is found throughout the group. Potential yields average 110 to 115 cubic feet per acre per year. Removal of acreage from timber production in this group would have a high impact on the productivity potential.

Table 9.4-42 summarizes the miles of each habitat group crossed, the acres impacted, and the volume of timber that would be removed for the proposed corridor and its alternative in the Ninemile Creek drainage.

TABLE 9.4-42 HABITAT GROUPS CROSSED, NINEMILE VALLEY ALTERNATIVE

| | | Habitat Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2, 3, 5 | 4 | Total | Total Timber Removal Volume-MBF |
| Impact Rating | | Low | Low | Mod | High | | |
| | Miles Crossed | 13.6 | 2.8 | 12.0 | 4.3 | 32.7 | |
| Proposed | | | | | | | 1593 |
| | Acres | 150 | 31 | 132 | 47 | 360 | |
| | Miles Crossed | 1.9 | 3.2 | 21.8 | 5.3 | 32.2 | |
| Alternative | | | | | | | 2641 |
| | Acres | 21 | 35 | 240 | 58 | 354 | |

The proposed corridor has a lower impact on forested land because fewer miles are located on the better timber-growing sites.

Terrestrial Wildlife

The wildlife resource assessment is based on the expected impacts resulting from changes in the winter and summer habitats and the critical winter thermal cover of big game animals. The effects on several bird species intolerant of habitat disturbance and for some birds more tolerant of disturbance is also included. Impacts to threatened and endangered species are considered separately from the above analysis.

Impact potentials are rated high on thermal cover and essential threatened and endangered wildlife habitat because of the probability that pipeline activities would prevent use of these areas by wildlife over a long period of time. The summer and winter habitats are rated as having a low impact potential because of the relatively short duration of impact during construction, the availability of other suitable habitat in close proximity, and the probability that the construction zone would provide browse within one or two year years after construction. Summer and winter habitats that may suffer longer-term impacts are noted. Impacts to birds are dependent on the amount of habitat modification that the species can tolerate.

Along the proposed route summer range for low numbers of deer and elk is provided in the upper area near Siegel Pass. Escape cover is currently limited. Pipeline clearing would further reduce this cover, but this would be short-term as the existing clearcuts would provide additional cover in 3 to 5 years. As a result of linking existing clearcuts to the pipeline clearing, edge-associated wild life species such as the western flycatcher, ruffed grouse, yellow-rumped warbler, junco, western tanager, chipping sparrow, saw-whet owl, and sparrow hawk would be adversely affected. Old-growth habitat would also be reduced along this segment. This would slightly impact old-growth dependent species such as the goshawk, Coopers hawk, Swainson's thrush, hermit thrush, Clark's nutcracker, Hammond's flycatcher, Townsend's warbler, pygmy owl, and great gray owl.

As the route segment descends to the valley bottom, winter range is encountered. This area also provides habitat for open country birds such as the kingbird, golden eagle and rough-legged hawk. This lower portion of the route passes through subdivisions, rangeland and small irrigated pastures. In general, impacts to the wildlife resource have already been made, and a pipeline would create little additional impact.

The proposed corridor segment would have a low to moderate impact on the existing summer range from Siegel Creek to Little Blue Creek. Impacts on winter range and the chance of increased harassment to big game would be minor because the existing influence of subdivisions and residences, road use, and noise are more overriding.

Impacts along the alternate corridor in the Siegel Pass area would be similar to those for the proposed route. The summer range presently has good forage values and a corridor opening would not improve browse conditions for big game. The remainder of this alternate route would cross transitional spring and fall range or winter range.

Big game use is moderately high from Blue Creek through Spring Creek (western mid-portion of segment). The Josephine Creek drainage is heavily timbered with second growth. Clearing impacts in this drainage should not be severe because of the high proportion of cover. Deer and elk use is high in McCormick Creek. Slopes between the forks in the drainage are 50 to 60 percent. Cutbanks resulting from pipeline construction would create a barrier for deer and elk, which would significantly inhibit them from using the area.

Butler Creek is bordered by private land which has been cleared or thinned. Big game use is slight to moderate and corridor clearing would have minimal impact.

The Spring Creek drainage contains critical winter range. Pellet data taken in April 1979 indicates 30-50 elk and 50-80 deer were concentrated in this area during the winter. The timber has recently been thinned and the present cover/forage ratio is 30/70. This is below an optimum of 50/50. Any further reduction of cover would significantly lower the present carrying capacity. The thermal cover zone is now less than 200 acres in total. Minumum thermal cover limits for elk have been established at 70 acres. Right-of-way clearing would sever this zone and leave two isolated islands that would not provide adequate winter thermal cover for elk. Deer do not require as large a thermal cover zone and would not be as negatively affected. Winter forage is not a limiting factor in this drainage so increased forage production in the right-of-way would be of little benefit to big game.

Towards the eastern end of this segment valuable deer and elk winter range occurs, particularly in the Roman and Edith Creek areas. During the winter of 1978-79, approximately 25-30 elk and 100 deer used this area. The population appears to be very close to the present winter range carrying capacity. The cover/forage ratio is near optimum at 50/50.

The effects of right-of-way clearing would be extremely adverse. The winter thermal cover provides an essential habitat requirement due to heavy snowfall and prolonged cold periods in the area; clearing would remove a portion of this critical cover. The clearing would also accumulate deeper snowpacks due to the loss of interception by trees and this would result in a barrier to animal movement. These conditions would put extreme stress on the animals and result in decreased survival rates.

This eastern end of the segment is currently subject to an increasing amount of off-road-vehicle use, particularly with snowmobiles. This is causing increased stress upon wintering deer and elk. Clearing of a right-of-way would aggravate the problem by creating a tree-free track.

The edge-associated wildlife species found along this segment would have similar impacts as those associated with the proposed corridor segment, and would be minor.

The western half of this alternative segment contains some excellent old-growth habitat for birds. An active Cooper's hawk nest near Big Blue Creek could be lost during right-of-way clearing. Other old-growth dependent species would be impacted to a degree similar to that along the proposed corridor. Snag-using wildlife would be severely impacted. Pileated woodpeckers which now nest along this alternate corridor might suffer a 10 percent reduction in habitat availability. The eastern one-third of this corridor contains only marginal habitat for several oldgrowth dependent species, and the impacts would be minimal.

In summary, this alternative would cause higher impacts on the wildlife resource than the proposed route. This alternative would cross more high-quality winter range, and increased snow accumulation in the cleared right-of-way would create barriers. Critical winter thermal cover would be eliminated, resulting in reduced big game populations.

Three threatened and endangered species are found in the vicinity of Ninemile Valley: the bald eagle (endangered), the peregrine falcon (endangered), and the grizzly bear (threatened).

Ranch and forest land, Ninemile Valley

Essential bald eagle winter habitat parallels the lower (east) end of the proposed route and the alternative. Neither route would cause any impact on bald eagles.

There is some essential peregrine falcon habitat near the mouth of Ninemile Creek, but this would not be impacted by pipeline construction or operation.

No portions of the proposed or alternate pipeline corridor is within identified grizzly habitat. Neither corridor would create additional impact upon the grizzly bear.

### Cultural Resources

The area which would be crossed by this route segment alternative has not been investigated for the purpose of identifying cultural resource sites.

### Visual Resources

Generally, the upper half of the proposed route has higher visual impacts than the upper half of the alternate route, and the converse is true of the lower portions of the two routes. As a result, neither route is clearly superior to the other from the standpoint of visual resources. It appears that by connecting the upper portion of the alternative route with the lower portion of the proposed route an overall route of minimum visual impact might be achieved.

### Land Use

Nearly 22 miles of the proposed route are located on private land, while only 7 miles of the alternate route crosses private land. The remainder in each case is on National Forest land. The pipeline could have a significant impact on private land in an area such as this where subdivision for homesites is occurring, because no buildings would be permitted on the right-of-way. The proposed route would cause a correspondingly greater interference with agriculture during the construction year than would the alternate.

Impacts to transportation and utility networks for the alternate route would be similar to the proposed route as described in chapter 3.

### Recreation

The Ninemile Creek drainage offers a wide variety of opportunities for year-round recreation, but because there are no outstanding attractions the present use is primarily by local people and is well below the capacity of the area. However, recreation use is increasing rapidly and is expected to continue to do so as long as subdivision of private land in Ninemile Valley and population growth in the surrounding areas continues.

The foothills and lower slopes are used for horseback riding, hiking, wildlife viewing, hunting, fishing, snowmobiling, snowshoeing, nordic skiing, and snow play.

The proposed route runs within one- to three-quarters of a mile upslope of three concentrated-use areas: Burnt Fork Creek, Soldier Creek, and Camp Creek, and passes almost directly over the Little Blue Lookout site which, although no longer in service as a fire lookout, serves as a recreational viewing point. In the short term, use of these sites would be curtailed or discontinued because of the disturbances associated with construction.

The alternative is a mile or more from these sites and would have considerably less impact during construction; however, it does pass within one-half mile of the old CCC camp site and a quarter-mile of the old Frenchtown Ranger Station site. After construction has been completed the impacts on these concentrated-use sites would diminish rapidly and the pipeline right-of-way could begin to serve as a recreation corridor. This could occur during the first year for sports such as snowmobiling, nordic skiing and motorcycling. As the soil becomes stabilized and vegetation reestablished (3-5 years) hiking and horseback riding along the right-of-way may become attractive to some local residents.

Both the proposed route and the alternate would have short term adverse impacts on fishing because of the disturbance associated with construction. Reduced hunter success would also occur as a result of construction activities and continue for 1 to 3 years, or until suitable browse and cover vegetation is stabilized. The alternate route could have less impact than the proposed route which crosses the lower reaches of streams triburary to Ninemile Creek.

The overall effects on recreation are similar for both the proposed route and the alternate. Neither stands out as being significantly better than the other. Barring a major oil spill, recreation activity would not be seriously impacted by either route in the long term.

### Social and Economic Conditions

#### Population

During the peak period of the construction phase 493 nonlocal workers would be added to the Missoula County population. The total population increase, of approximately 1,100 persons, is not considered to be significant. Population increases occurring as the result of the operation phase would be minor in proportion to the existing population projections and are not considered significant.

#### Infrastructure

Strains on infrastructure components would occur. Due to the relatively short duration of the peak construction period these would not be significant. No significant negative effects would occur on infrastructure components during the operation phase.

#### Social Well-Being and Quality of Life

Approximately 2,000 people live in the vicinity of the Siegel Pass-Ninemile pipeline segment in the towns of Huson and Frenchtown, and in settlements and on ranches in the Mill Creek, Sixmile, and Ninemile Valleys.

In February, 1979, the Northern Tier Pipeline Company announced that the proposed primary pipeline route would be located in the Siegel Pass and Ninemile Valley area instead of the Flathead Indian Reservation.

A portion of the property owners in Frenchtown and the Valley settlements formed the Valley Preservation Council as a means of developing and focusing residential interest on proposed pipeline construction and operation concerns. Strong opposition to the proposed project has been expressed by many of the local residents at public meetings and in letters.

The project would have no significant impacts on such social well-being indicators as employment opportunities, personal income, or governmental services. However, quality of life indicators would be negatively affected by the construction and operation phases. For example, recreational opportunities would be diminished during the construction phase. Residents perceptions of the aesthetic setting of the region would be changed by alterations in the existing scenic status of forested lands due to construction and operation of the pipeline. Concerns over the quality of water would be increased by fears of potential oil spills and/or accidents. The valley area, as a "place to live" would be changed from its present, relatively natural, atmosphere.

### MILWAUKEE RAILROAD, MISSOULA, MONTANA

On February 6, 1979 the Missoula Planning Board requested that NTPC examine the feasibility of using the existing Milwaukee Railroad right-of-way rather than using the proposed route on the north side of Missoulá. This was recommended because the Milwaukee Railroad has announced plans to abandon all facilities in western Montana. The Missoula Planning Board's purpose was to avoid the proposed route crossing Rattlesnake Creek, an area of public significance, and to use the completed pipeline right-of-way through Missoula as a parkway that could have significant recreational and aesthetic value.

On March 26, 1979, NTPC requested BLM to evaluate an alternate route through the city of Missoula utilizing the Milwaukee Railroad right-of-way. NTPC provided a description and feasibility study which has been used for BLM's evauation (April 1979). The alternate route would use the Milwaukee Railroad right-of-way from Huson through Missoula to Bonner where it rejoins the proposed route.

This alternate route would depart from the proposed route at pipeline mile 529, west of Frenchtown, and join the railroad right-of-way near Huson (figure 9.4-13). The route continues on right-of-way through the city of Missoula, across the Clark Fork River, and rejoins the proposed route near Bonner at pipeline mile 555.

It would use 25 miles of the railroad right-of-way. Total distance for the alternate would be about 28 miles compared to 26 miles for the proposed route. Additional crossings would be two on the Clark Fork River, two on Interstate Highway 90, eleven on asphalt roads, and five on railroads. NTPC would be required to use special construction conditions for about 24 miles, due primarily to traffic congestion.

The alternate route using the railroad right-of-way has fewer construction impacts upon private land use but there is more potential for contamination of aquatic resources during operation. The publicly significant Rattlesnake Creek area on the proposed route is avoided but the additional crossings and closer proximity to the Clark Fork River and the Missoula city water supply causes potential impacts on the alternate route.

The alternate route avoids soils and geologic impacts attributed to the proposed route along the north side of Missoula. Soil erosion and slope instability problems exist for the proposed route but would be avoided for 25 miles of the 28-mile alternate.

Seismic hazard potential along the Missoula Valley would be similar for both routes. As the alternate route would be further from the trace of the Ninemile Creek fault zone than the proposed route, anticipated impacts (ground shaking, surface fault rupture, liquefaction) resulting from movement along this fault would be less. However, the alternate route would cross a fault east of Missoula that the proposed route would avoid. Consequently, the anticipated impacts resulting from movement along this fault would be greater along the alternate route. As both faults have shown apparent movement within the past 2 to 3 million years, they are both considered potentially active. A small magnitude earthquake may have occurred along one of them within the past few years, suggesting that the potential for movement along both faults needs further study prior to the estabishment of final design criteria.

Potential contamination from pipeline leaks or rupture exists for the Missoula city water supply. The alternate route bypasses six wells that make up the majority of the city water supply. These groundwater wells vary between 100 to 150 feet deep and are recharged by the Clark Fork River. Due to their close proximity to the railroad right-of-way, a pipeline leak into either the Clark Fork River above the wells, or into the groundwater supplies would contaminate the Missoula city water supply. This potential impact would be greater on the alternate rather than the proposed route, which crosses below the intake for water supply from Rattlesnake Creek.

Land use impacts upon private lands would be reduced on the alternate route. For the total distance of 28 miles only 3 miles would be across private land, the remaining 25 miles located on railroad land.

Impacts on transportation during construction could be greater on the alternate route. This route would cross Interstate 90 twice and 11 other asphalt roads. Missoula bypass traffic on Interstate 90, and local traffic would probably have more interruptions on the alternate route. During the operation phase, there would be negligible impacts upon transportation and utilities for either the proposed or the alternate route.

Social impacts of the alternate route would consist mainly of short-term traffic congestion and public interference during the construction period. This would probably continue for a slightly longer period of time due to special construction techniques required through the city of Missoula. Social impacts upon population, housing or public facilities would be similar for the alternate and proposed route since employment for this construction spread would probably occur in Missoula.

Economic benefits would result from increased construction costs for the alternate route. NTPC estimates a \$15.4 million cost for the proposed segment compared to \$25 million for the alternate segment. The \$9 million increased cost would benefit employment and stimulate the local economy of Missoula during the construction period. Social and economic impacts during the operational phase would be similar for both route segments.

## MISSOULA-GARRISON-HELENA

NTPC originally proposed the Missoula-Garrison-Helena alternative to eliminate crossing the Flathead Indian Reservation and as an alternative to the proposed route.

This route would start from Missoula, Montana, follow Interstate 90 to Garrison, and State Highway 12 to Helena for a total distance of 115 miles (figure 9.4-14).

Beginning east of Missoula at pipeline mile 555, in Missoula County, the route would travel south along the south side of the Clark Fork River. East of Missoula the route would follow the Burlington Northern Railroad and Interstate 90 to Garrison, then State Highway 12 to Helena, joining the proposed route at pipeline mile 656. Total distance would be 115 miles as compared to 101 miles for the proposed route.

### Climate and Air Quality

No impacts on climate are anticipated for this alternative pipeline route.

Air quality impacts would be similar to those for the other alternative route segments.

### Noise

Noise impacts associated with pipeline construction and operation would be similar to those associated with the other alternative route segments. Some scattered residences would be affected by construction noise.

### Topography and Geology

This route segment alternative would cross moderately steep mountains and small intermontane Tertiary basins, intersect numerous small drainages, the Clark Fork and Little Black Rivers. Topography is similar to that of the proposed route. Topographic impacts consisting of landscape changes and some temporary drainages alterations, would be essentially the same. Both routes would encounter similar geologic material consisting of Precambrian sedimentary/metasedimentary rocks, Mesozoic/Paleozoic marine sediments, Tertiary/Cretaceous granitic rocks, Tertiary nonmarine sediments and volcanic rocks, and Quaternary alluvium. Impacts to geologic material including excavation of large volumes of material and some change in the physical characteristics of the geologic material (e.g., porosity, permeability, inherent rock strength, moisture content), would be nearly identical to the proposed route.

### Geologic Hazards

As with the proposed route, this route segment alternative would cross a region exhibiting two levels of seismicity--an area of moderate activity corresponding to a Seismic Risk Zone 2 (moderate earthquake damage expected) between Missoula (Garrison alternate route pipeline mile 0) and McDonald Pass (pipeline mile 85), and an area of high seismic activity corresponding to a Seismic Risk Zone 3 (maximum earthquake damage expected). Both the proposed and alternative routes would cross the active Prickly Pear Fault (pipeline mile 655) and come within 2 miles of the active Scratchgravel Hills Fault (2 miles north of the Prickly Pear Fault). However, the proposed route would cross an additional fault (potentially active) near Snowshoe Creek

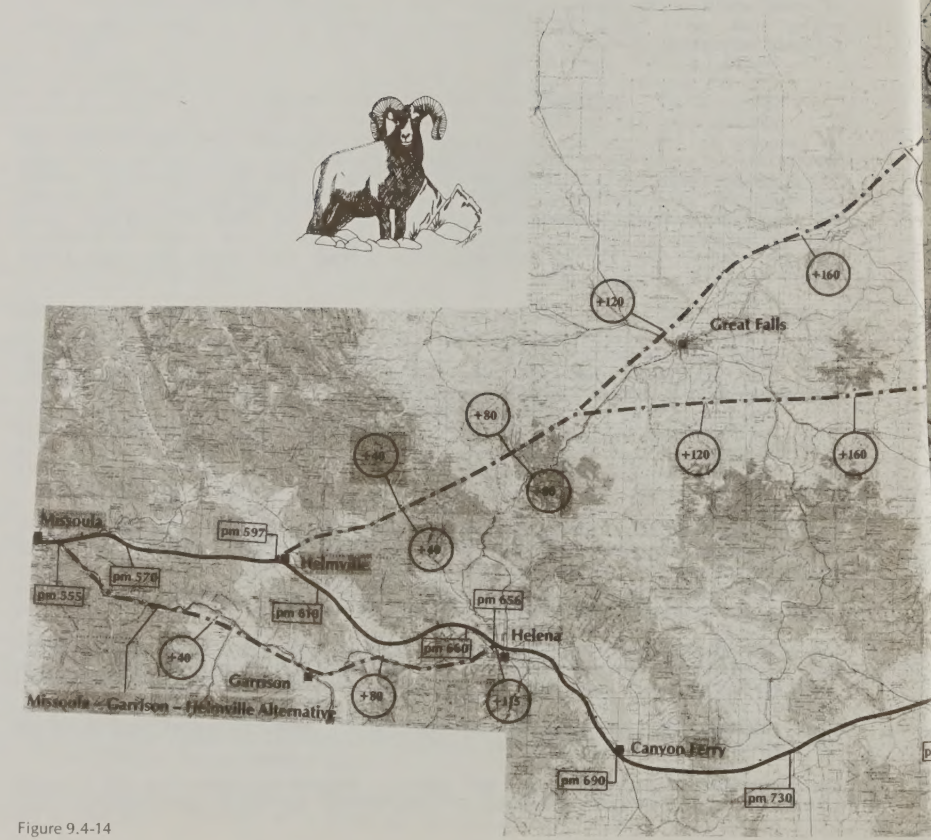
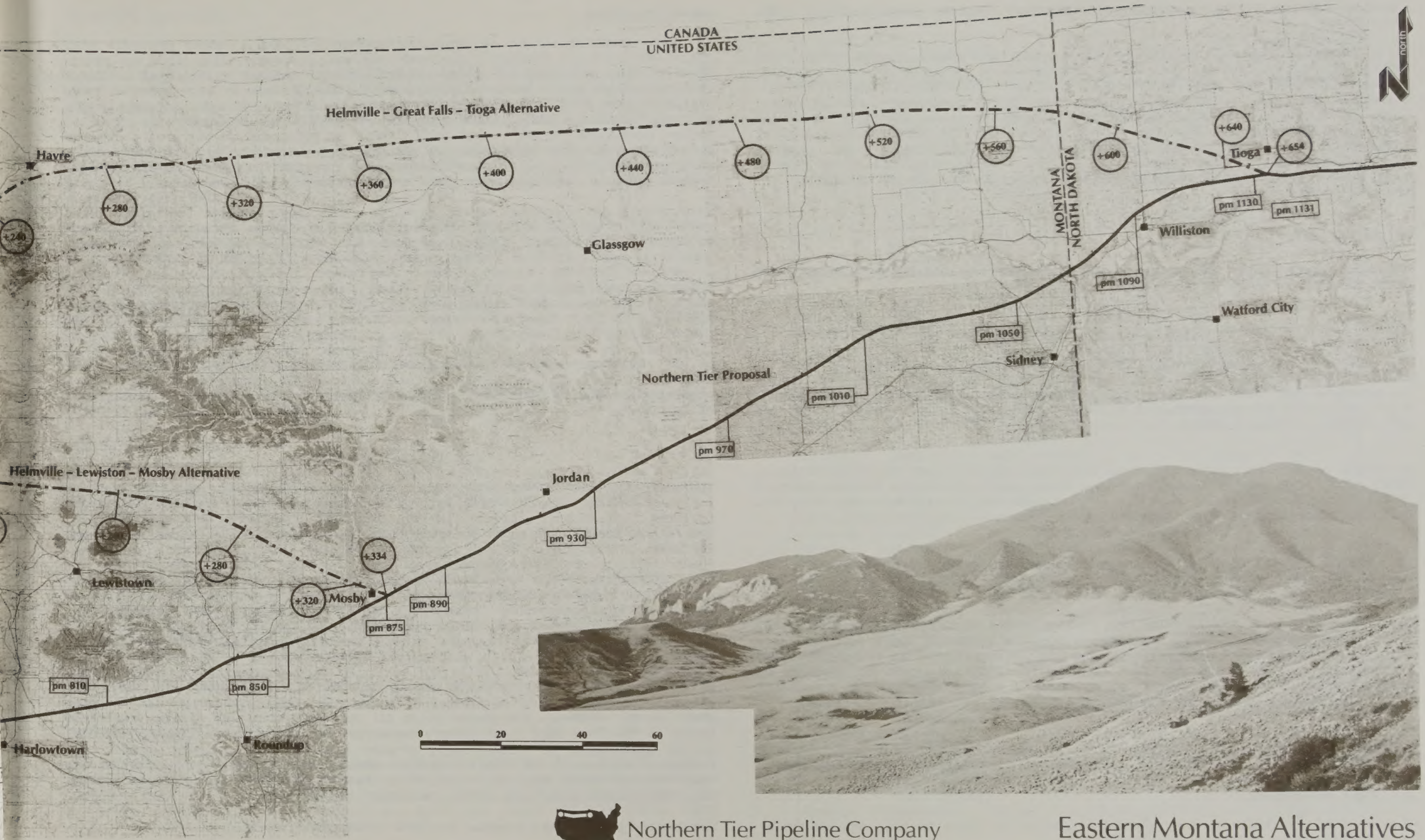


Figure 9.4-14



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(pipeline mile 633). Consequently, potential seismic impacts would be greater along the proposed route.

While potential slope instability problems occur along both routes, this route segment alternative contains more sites, both landslide and liquefaction. Potential landslide problems have been identified at Flint Creek (Garrison alternate route 42), Elliston Creek (pipeline mile 80), McDonald Pass (pipeline mile 85), and Broadwater (pipeline mile 95). Potential liquefaction problems have been identified along the Clark Fork River between pipeline mile 0 and 20, 30, the Little Blackfoot river (pipeline mile 65), Spotted Dog Creek (pipeline mile 70), Elliston Creek (pipeline mile 80), and Nelson Gulch (pipeline mile 110). Consequently, this route segment alternative, would have greater potential slope instability problems than the proposed route.

## Mineral Resources

The anticipated impacts to mineral resources would be the same for both the proposed route and this alternate route segment.

## Soils

From Missoula the route parallels the Clark Fork River for a distance of about 35 miles through undifferentiated alluvial soils. Depths to gravel, cobble, or bedrock is sometimes less than 2 inches. The route leaves the Clark Fork River for about 6 miles and passes through steep, hilly grasslands where soils are moderately deep and are gravelly, stony, or cobble.

Returning to Clark Fork River the route traverses both bottomland and foothill soils. After about 18 miles the route leaves the river and traverses the southern part of Powell County through soils on nearly level slopes and alluvial benches. Principal soils are deep loams and clay loams with slowly permeable clay loam subsoils.

The remaining 16 to 20 miles of the route to Helena passes through steep mountain slopes and hilly uplands with shallow to moderately deep loamy soils overlying limestone or granite bedrock.

Major impacts on soil would result from erosion losses on steep, unprotected slopes. Annual losses without protective vegetation would be approximatly 16 tons per acre. This would be reduced to less than 1 ton per acre per year when vegetation was reestablished. Soil compaction from construction equipment would be moderate on the predominantly loamy and gravelly soils. Loss of productivity would be no greater than an estimated 5 percent and should return to normal in 2 years.

Blasting and excavating the pipeline trench through the shallow soils would increase the potential for profile mixing and dilution. Without careful topsoil segregation and replacement natural soil fertility would be reduced by at least 10 percent and would be permanent.

Impacts from potential oil spills would be similar to those on the proposed route.

## Aquatic Resources

### Physical Components

The Clark Fork and Little Blackfoot Rivers exhibit seasonal variation of discharge with peak flows anticipated in spring and low-flow periods in late summer. Water quality of both rivers is classified as B-B, by the State of Montana, indicating very good water quality. Water can be characterized as calcium-bicarbonate type.

Ground water is generally limited to alluvial and glacial deposits in intermontane valleys within the area. Ground water generally isn't used in the mountainous regions; however, surface waters are directly supplied by ground water sources.

Construction and operation of the pipeline would impact surface and ground water resources. Increased sediment loads would occur in streams during and for a short time after construction. Cumulative effects from multiple crossings could intensify impacts if construction at crossings occured concurrently. The alignment parallels streams for over 90 percent of the route between Missoula and Helena, Montana. Sediment impact potential to streams exists from construction along most of this route. Hydrostatic test waters would be withdrawn from surface waters along the pipeline. Up to a 2 percent decrease in stream baseflow would occur if water were removed during mean flow periods.

No adverse impact would be anticipated from normal operation of the pipeline. However, in the event of a pipe rupture oil would be carried to surface waters, causing water quality degradation. Refer to chapter 3 for a more detailed discussion of impacts.

### Biological Components

The most important streams along this alternative route segment supporting fishery resources include the Clark Fork and Little Blackfoot Rivers. Numerous tributaries of these streams are crossed. The most important sport fish species found along this route include cutthroat, brook, brown, rainbow, and Dolly Varden trout, and whitefish.

These populations would be reduced through sedimentation of spawning gravel caused by instream trenching during construction and streambank erosion during the first years of project operation. Recovery of reduced populations should occur within a few years as vegetation became reestablished. If an oil spill occurred during project operation, fish populations would be reduced downstream for several miles. These reduced populations would also require several years to fully recover.

It is not known whether sediment related impacts to fishery resources along this alternative segment would be greater or lesser than those associated with the proposed route. However, the chance of an oil spill occurring and causing downstream losses to the Clark Fork River fishery resources--the most valuable fishery resources in the area--would be substantially greater than with the proposed route. The fisheries resource of the Little Blackfoot River (tributary to the Clark Fork River) would also be quite vulnerable to fishery losses since the river would be crossed twice and closely paralleled for approximately 10 miles.

See chapter 3 for a more detailed analysis of impacts.

### Terrestial Vegetation

This alternate segment, like the corresponding portion of the proposed route, is within the Douglas-fir ecoregion (see Map Addendum). Dominant overstory vegetation includes Douglas-fir, western larch, subalpine fir, and ponderosa pine. Range grassland vegetation, including blue bunch wheatgrass, needle and thread, and prairie pine grass, occupies the corridor primarily in river valleys. Riparian habitat, dominated by cottonwood and willow, is relatively common within this alternative segment. Where forest vegetation is absent or uncommon, riparian vegetation becomes a substantially more important component of the vegetative community. Riparian habitat becomes a major addition to vegetative diversity in areas where cropland or grassland is dominant. This alternate route would require removal of twice as much riparian vegetation.

The impact on riparian vegetation would be relatively substantial within this alternative corridor. About twice the riparian cover would be removed from this alternative than from the proposed route.

The impact on dominant forest vegetation is probably the most substantial impact of this alternative, because trees would not be permitted to mature on the right-of-way and because a substantial portion of the route is forested. Assuming that all forestland has about the same productive capability as the National Forest's crossed by the corridor, about 31 more acres of timber would be lost on the alternative route. Most of this loss would continue for the entire life of the project.

At this time no endangered or threatened species are known to occur within this proposed alternative route segment.

### Terrestrial Wildlife

Suitable peregrine falcon nesting habitat exists along the Clark Fork River, but no known eyries have been identified. Construction activities near nesting and/or roosting areas would be very disruptive during nesting and fledgling stages.

Impacts to wildlife habitat would include removal of forested wildlife habitat and removal of riparian wildlife habitat in national forests (USFS 1978). Most of the riverine habitat along the Clark Fork River drainage provides important white-tailed deer and elk winter range. Much of the private land contiguous to the national forests is rapidly being subdivided and becoming unsuitable for big game use. Impacts from additional removal of winter range by construction of the pipeline would increase dependence on the already heavily used winter range in national forests. Construction during late summer would reduce impacts.

Wintering waterfowl concentrations also use the valley lowlands of the Clark Fork River drainage. Summer construction would reduce disturbance to waterfowl.

### Cultural Resources

The cultural resource sites listed below would potentially be affected by this route segment alternative. Of these known sites the Mullan Road has been designated as a National Historic Civil Engineering Landmark. There is high potential for the discovery of additional archaeological and historical sites all along this route segment alternative. The currently known sites are listed in table 9.4-43.

TABLE 9.4-43 CULTURAL RESOURCES FOR MISSOULA-HELENA ALTERNATIVE

| County | Site Name | Site Type | Approximate Segment Pipeline Mile |
|---|---|---|---|
| Missoula | Lewis and Clark Trail (Lewis in 1806) | Early 19th century exploration route, a national historic trail | 1 |
| Missoula | Trail followed by Col. Gibbon to Battle of Big Hole | Nez Perce and U.S. military history | 1 |
| Missoula | Mullan Road | 19th century military, freight, and transport route | 1-80 |
| Missoula | 24MO1 | Prehistoric occupation | 15 |
| Missoula | 24MO13 | Prehistoric occupation | 15 |
| Missoula | 24M012 | Prehistoric occupation and visible traces of Mullan Road, a National Historic Civil Engineering Landmark | 16 |
| Missoula | 24MO1002 | Prehistoric occupation and visible traces of Mullan Road, a National Historic Civil Engineering Landmark | 17 |
| Granite | 24GN63 | Medicine Tree | 25 |
| Granite | 24GN2 | Prehistoric occupation | 25 |
| Granite | 24GN3 | Prehistoric occupation | 26 |
| Granite | 24GN64 | Burial | 26 |
| Granite | 24GN115 | Historic school house | 27 |
| Granite | 24GN116 | Historic Flathead campsite | 29 |
| Granite | 24GN80 | Historic artifacts | 29 |
| Granite | 24GN4 | Prehistoric occupation | 29 |
| Granite | 24GN65 | Prehistoric pigment quarry | 29 |
| Granite | 24GN144 | Bearmouth historic townsite | 31 |
| Granite | 24GN117 | Prehistoric occupation | 32 |
| Granite | 24GN151 | Historic stage station | 33 |
| Granite | New Chicago | Historic townsite | 41 |
| Powell | Gold Creek Historic District | Mining and settlement history | 49-54 |
| Powell | Trails followed by Captain Cushing and by the Deer Lodge Volunteers in 1877 | Nez Perce and U.S. military history | 56 |
| Powell | 24PW1065 | Burial | 58 |

TABLE 9.4-43 (Continued)

| County | Site Name | Site Type | Approximate Segment Pipeline Mile |
|---|---|---|---|
| Powell | Grant Cabin Site | Historic cabin | 61 |
| Powell | 24PW6 | Vision quest site | 77 |
| Lewis and Clark | 24LC102 | Historic mine Site | 83 |
| Lewis and Clark | Wasseiler Hotel and bathhouses | Social history listed in the National Register of Historic Places | 93 |
| Lewis and Clark | Broadwater Hotel and Spa | Social history | 94 |

Potential impacts to these known sites and to any presently unrecorded sites would be the same as those discussed in chapter 3.

Visual Resources

This route segment alternative traverses grasslands, forested and agricultural land, and parallels the Clark Fork River and Interstate 90.

Construction of a 90-foot right-of-way in this highly scenic and visually sensitive area would require clearing of trees, blasting of rock outcrops, cut and fill slopes, and construction of access roads in the foreground view of travelers on Interstate 90. The new rock and soil color exposed by cut and fill slopes, the contrast of form, line and texture of landform and vegetation would exceed visual resource quality objectives for class II and III and would constitute a severe adverse visual impact.

Proposed construction of the pipeline right-of-way in the congested Pinegrove-West Riverside area within the Interstate 90 right-of-way would be viewed in the immediate foreground zone by travelers on this highly used scenic highway. This exceeds the objective of subordination to the landscape, and would constitute a severe adverse visual impact.

Construction of the proposed pipeline along the Clark Fork River and the Little Blackfoot River could have moderate to high visual impact on travelers on Interstate 90 and U.S. Highway 12.

The impact should be substantially reduced after 1 to 2 years and persist as low for the life of the project.

Land Use

There would be approximately 1 mile of construction activity adjacent to residential areas on the fringe of Missoula. The anticipated impacts to this urban fringe area would likely be limited to the nuisance of noise, dust, visual disharmony, and traffic congestion, lasting for 1 to 2 weeks as described in chapter 3. Compared to the proposed route, this alternative would affect approximately the same amount of agricultural forest and rangeland.

According to Powell County land use plans, this route would be preferable to the proposed route because it follows Interstate 90 and other existing utility corridors.

Transportation and Utility Networks

In general, the impacts to transportation and utility networks would be as described in chapter 3. In some areas, however, impacts might be more severe than on the proposed route.

Construction activity through the urban fringe of Missoula would cause temporary traffic disruption and congestion.

The risk of physical damage to other utility systems would be higher on this route primarily because of construction through the narrow Clark Fork River valley east of Missoula where the pipeline would be parallel to and make several crossings of the Yellowstone Petroleum Products Pipeline, Montana Power Natural Gas Pipeline, electric transmission lines, and the Burlington Northern Railroad.

This route would require additional railroad crossings and crossings of Interstate 90. The number of other state and Federal highway crossings would be about the same.

The amount of new access road construction required would probably be comparable; however, there would be an estimated 8 to 10 miles less electric transmission line construction required to serve the pump stations. The impact to regional power supplies would be essentially the same as that of the proposed route.

Recreation

Southeast of Missoula an oil pipeline leak or rupture would affect anglers who fish the Clark Fork River. Missoula area residents have worked since the early 1970s to improve fishing quality in the Clark Fork River. The river is gradually returning to its original importance as a stream fishery of more than local interest. Man-days of fishing pressure from Missoula to Garrison was 9,764 in 1977 (Montana Department of Fish and Game 1978). Rock Creek, tributary to Clark Fork, is one of two blue ribbon fishing streams west of the Continental Divide. Oil pollution or construction/abandonment caused turbidity would affect fishing success for local anglers as well as out-of-state visitors.

Several camp and day use areas could be crossed by the pipeline centerline. Recreation such as fishing, float trips, picnicking, swimming, and camping occur along the Clark Fork River and along the Little Blackfoot River from Garrison to Helena (see Map Addendum for locations). The MacDonald Pass area, 15 miles west of Helena, receives high use year around. Present high scenic values would be degraded by pipeline construction in the MacDonald Pass area. The Continental Divide National Scenic Trail would be crossed. Impacts to recreationists would be significantly greater along this route alternative compared to the proposed route.

### Social and Economic Conditions

The route would cross through the counties of Missoula, Granite, Powell, and Lewis and Clark. Silver Bow County would be affected by this alternative since the cities of Anaconda and Butte could provide housing and services for pipeline workers. Impacts on these counties are discussed in chapter 3.

Granite County would receive the benefits of increased assessed valuation and property taxes. Short-term construction impacts from workers camping close to the route would be greater in Granite County than those resulting from the proposed route. Construction impacts would be decreased substantially, since few workers would reside in the county.

## HELMVILLE, GREAT FALLS, MONTANA TO TIOGA, NORTH DAKOTA

The Montana Department of Natural Resources developed this route segment as an alternate to the proposed southern route from Helmville, bypassing Helena and continuing eastward to the Montana border. BLM, for purposes of this ES, continued the route into North Dakota, paralleling the existing Portal Pipeline and rejoining the proposed route south of Tioga.

Beginning near Helmville at pipeline mile 597 this route segment would travel northeast across Helena National Forest, generally following State Highway 200 bypassing Great Falls on the west (figure 9.4-14). The route would continue northeast across private lands, cross State Highway 87 south of Havre and then extend eastward. The route would bypass the Fort Peck Indian Reservation on the north side and at Dagmar, Sheridan County, the route would head southeast and cross into North Dakota. Near Grenora the route would join the Portal Pipeline right-of-way and follow it to Tioga, rejoining the proposed route at pipeline mile 1,131. Total distance for this alternate route segment is 654 miles compared to 534 miles for the proposed route.

### Climate

No significant impacts on climate would be anticipated.

### Air Quality

Air quality impacts during construction would be about the same as those associated with the proposed route. No significant impacts would occur during the operation phase.

### Noise

Noise levels during construction would be about the same as those for the proposed route. A small number of residences would experience a temporary increase in noise levels. No significant impacts would occur during the operation phase.

### Topography and Geology

The topography of this route segment alternative would be essentially the same as that of the proposed route between pipeline mile 597 and 1,131 and would consist of moderate to steep mountains and intermontane tertiary basins in the western portion and a series of gently eastward-sloping terrace-like rolling hills, highly dissected badlands, and numerous north to northeast trending drainages in the eastern portion. Consequently, topographic impacts would be nearly identical.

Geologic material traversed by this route segment alternative would be similar to that encountered along the proposed route--Precambrian metasediments, Cretaceous marine sediments, Tertiary non-marine sediments, Mesozoic volcanic material, Quaternary alluvium, and some Quaternary glacial debris. Impacts as a result of construction (removal of between 8,600 cubic yards per mile in gentle terrain up to perhaps 250,000 cubic yards per mile in mountainous terrain and some change in the physical characteristics of the material) would be nearly identical.

#### Geologic Hazards

This route segment alternative would cross a region of moderate seismic activity corresponding to Seismic Risk Zone 2 (moderate earthquake damage expected) located in the portion of the route from Havre to the eastern end near Tioga, North Dakota. The proposed route would cross an area of high seismic activity corresponding to Seismic Risk Zone 3 (major earthquake damage expected) located in the vicinity of Helena, as well as regions of moderate (Seismic Rick Zone 3) and low (Seismic Risk Zone 1) seismic activity. Potential impacts from ground shaking would be greater along the proposed route. No active or potentially active faults (i.e., surface ruptures with apparent movement within the past 2 to 3 million years) have been found along the route segment alternative nor have any liquefiable sediments been found. Quaternary faults and zones of potential liquefaction may exist along this route segment alternative; but the lower seismic level would predict impacts lower than those along the proposed route.

Slope instability and outburst flooding hazards may exist along this route segment alternative but no locations have been identified. An assessment of comparative impacts is not possible.

#### Mineral Resources

The alternative would cross the Reserve coal field near Reserve, Montana, and a corner of the Avoca coal field near Tioga, North Dakota, and could interfere with coal recovery operations. The proposed route would cross the Avoca and Williston coal fields in North Dakota and Weldon coal field in Montana. Anticipated impacts on coal development would be the same.

## Soils

Soil disturbance and alteration would occur on almost 8,000 acres within the right-of-way compared to about 6,500 acres for the proposed route.

Detailed information on soils along the route is lacking. The following analysis is based on general reconnaissance soil survey reports published in 1932 and 1953. It is not possible to make accurate comparisions of resources and potential impacts.

Two physiographic regions, Rocky Mountains and Great Plains, would be traversed. Most of the right-of-way would be within the Great Plains region. More than 90 percent of the soils have a loamy surface texture which would enhance revegetation. Clayey subsoils are exposed on some soils and others have high clay content (460 acres). Combined with low annual precipitation, these conditions are not conducive to revegetation.

About 60 percent of the soils are fair to well-suited for farming. The Scobey and Williams soil series are well represented. At least 43 percent of the route would have moderate to high susceptibility to water erosion. Loss of topsoil could exceed 45 tons per acre per year in extreme cases. Most of the route would return to soil loss rates of less than 5 tons per acre per year once vegetation was re-established. Because of the predominantly loamy surface textures, moderate wind erosion would occur on most soils immediately following construction. Wind erosion losses exceeding 45 tons per acre per year could be expected on 6 to 10 percent of the route.

Other impacts would be similar to those that would occur along the proposed route segment.

## Aquatic Resources

### Physical Components

The largest streams crossed by the alternative route segment would be Nevada Creek, Blackfoot River (three crossings), Dearborn River, Sun River, Teton River, Marias River, Milk River, Poplar River, Big Muddy Creek, and Little Muddy River. Nevada Creek and the Blackfoot River are tributaries of the Clark Fork River; the other streams are tributaries of the Missouri River. More than 30 smaller streams would also be crossed. Water quality and discharge data has not been identified for streams along this route. Groundwater resource information has not been identified.

Construction of trenches across streambeds would disturb sediments, which would temporarily degrade water quality downstream from the crossings. Erosion from streambanks could contribute sediment to streams until revegetation occurs. An oil spill would degrade water quality for several miles downstream. Impacts on surface water resources along this route segment would be less significant than those along the proposed route.

### Biological Components

Fisheries resources have not been identified along this route segment, however, a few streams probably support one or more trout species, while many streams probably support warm water species including northern pike, walleye, catfish, sauger, perch, and crappie. Nearly all streams support forage fish such as minnows and sculpins.

Construction in the streambed and erosion from the streambank would contribute sediments which could damage trout spawning areas and reduce trout populations. Streambank erosion could continue during the operation phase until vegetation becomes reestablished. Since spawning areas have not been identified, it is not known to what extent trout populations would be reduced. An oil spill could reduce fish and aquatic insect populations for many miles downstream from the spill site Recovery of reduced fish population resuting from sedimentation or an oil spill could take several years. Impacts on fisheries resources along this route segment would be less significant than those along the proposed route.

## Terrestrial Vegetation

This alternative would cross the Douglas-fir ecoregion between pipeline miles 597 and 660, the Gramma-needlegrass-wheatgrass ecoregion between pipeline miles 660 and 1050, and the wheatgrass-needlegrass ecoregion between pipeline miles 1050 and 1251. The vegetation of these ecoregions is described in chapter 2. The vegetation types crossed by the alternate segment would be essentially the same as those crossed by the proposed route segment. The alternate would cross less forest land of the Douglas-fir region, however, and would require clearance of fewer acres of timber. The overall length of the pipeline would be increased by 120 miles under this alternative, thereby requiring an additional 1,309 acres of land. Areas of special concern include areas of near-pristine vegetation (grasslands), areas nominated by the state for natural areas because of their scenic, biological, or geological qualities, and habitats of plant species proposed for threatened or endangered status.

Near-pristine or relict vegetation stands within Montana's rangeland have been identified and inventoried by the Soil Conservation Service. Detailed studies of soil, climate, and vegetation have been conducted on these sites to establish ecological benchmarks upon which the condition of ranges which are being grazed can be compared with nature's potential. Each site is small, and protection is afforded through cooperation of the landowner (SCS 1973).

Four of these study sites are located near the pipeline study corridor.

The first site is the Helmville Cemetery, located 1 mile southwest of Helmville, Montana at pipeline mile 605. The site is on the edge of the 2-mile study corridor, and would be affected only in the event of a major oil spill in the area. The second site, located 2 miles southwest of Bowman's Corner along State Highway 200 (pipeline mile 670), is far enough away to have no adverse impacts, even from an oil spill. The third site, on top of Square Butte at pipeline mile 698, is elevated several hundred feet above the surrounding landscape and would not be impacted. The fourth site, located within the boundaries of the Benton Lake National Wildlife Refuge (pipeline mile 730), is also elevated several hundred feet above the proposed corridor, and is several miles north of it. No adverse effects to this site are expected.

The Montana Natural Areas Act of 1974 provides that a system of natural areas posessing scenic, biological, and geological features of educational and scientific value be established and protected. The pipeline study corridor comes within 2 miles of one such area 31 miles west of Great Falls. Crown Butte, an area covering 657 acres has been nominated as a potential Montana State Natural Area. Impacts to this area from pipeline construction would be minimal. An oil spill during pipeline operation might affect the area, though the probability of a spill reaching the area is remote. No plants which have been studied for nomination to Federal lists as threatened or endangered species are known to occur along the study corridor.

### Terrestrial Wildlife

Impacts of pipeline construction on wildlife along the north alternate would be of the same general character as those described for the proposed route in chapter 3. Wildlife areas of special concern along the proposed route (described in chapter 2) which would also be affected by this alternate include the Blackfoot River-Garnet Range area.

The Blackfoot River Canyon segment between Dalton Mountain and Lincoln Gulch (pipeline mile 613 to 623) is bald eagle habitat. Several sections owned by the U.S. Forest Service in this canyon have been proposed as "essential bald eagle habitat." Historical and potential peregrine falcon eyries can also be found along the Blackfoot River, though none are active at present. The peregrine falcon is an endangered species in the United States, and only one active eyrie is known to exist in Montana (Haynam and Sumner 1977). Additional activity along the river from construction and monitoring could force abandonment of eagle nests and prevent reintroduction of peregrine falcons.

The pipeline route between Lincoln and Roger's Pass (pipeline mile 626 to 648) traverses important grizzly bear habitat (Mealey et al. 1977). The grizzly, a threatened species in the United States, might be affected by construction noise and dust as well as airplane noise during monitoring and potential oil spills during operation. However, since the pipeline would follow the existing corridor along State Highway 200, impacts to the grizzly would probably be small. This area is also within the current range of the threatened northern rocky mountain wolf (NRMWRP 1978). Impacts to this species would be minimal. The proposed route does not pass through the range of either the grizzly or the wolf.

The Garnet Range-Blackfoot River area is elk habitat. The river lowlands contain important winter range for elk and deer. Elk, sensitive to disturbance, may be displaced for several miles from the corridor during construction.

Wildlife refuges and wetland marshes might be impacted by construction noise and dust. Also, monitoring of the pipeline every 2 weeks by airplane might discourage nesting of some species if the refuge or marsh is very close. Oil spills during operation might impact large feeding areas which would be lost for several seasons. Wildlife refuges potentially impacted include Benton Lake NWR (pipeline mile 730) and Hewitt Lake NWR (pipeline mile 980).

### Cultural Resources

Areas crossed by this route segment alternative have not been investigated for the purpose of identifying cultural resource sites.

### Visual Resources

This alternate would by-pass the Helena area and traverse less populated areas. It would have significantly less overall visual impact.

### Land Use

New wilderness study areas are lands selected for study as possible additions to the National Wilderness Preservation System (see chapter 2). They are managed to protect their wilderness values until studies are complete and land use recommendations implemented. Inventories of candidate roadless areas have been undertaken by both the U.S. Forest Service and the BLM.

Between pipeline miles 810-830 and 950-1030 are tracts of BLM land designated as roadless area inventory units. Seven of these wilderness study units would be crossed by the north alternate corridor (BLM 1979).

Only one of these units is being recommended for intensive inventory. Management policies mandated by Congress for these units while they are being studied would preclude a pipeline corridor through this unit. This management policy would apply between pipeline miles 1005 and 1025.

### Transportation and Utilities

The alternate route would include about 19 major highway crossings and 6 railroad crossings. Table 9.4-44 lists the highway and railroad crossings and approximate pipeline mileage.

Construction would cause short term disruption of transportation networks. The operation phase would not have significant impacts on highway or railroad transportation systems. These impacts would be similar for the crossings on the proposed pipeline route.

TABLE 9.4-44 RAILROAD AND HIGHWAY CROSSINGS ON HELMVILLE-TIOGA ROUTE SEGMENT ALTERNATIVE

| Highway or Railroad | Pipeline Mile |
|---|---|
| State Highway 200 | 608 |
| State Highway 200 | 613 |
| State Highway 200 | 631.5 |
| State Highway 200 | 645 |
| State Highway 200 | 647 |
| State Highway 200 | 651 |
| State Highway 200 | 652 |
| State Highway 287 | 670.5 |
| Great Northern Railroad | 717 |
| State Highway 89 | 717 |
| Burlington Northern Railroad | 845 |
| State Highway 87 | 845 |
| State Highway 2 | 904 |
| Burlington Northern Railroad | 904 |
| Harlem to Turner Highway | 910 |
| Great Northern Railroad | 980 |
| Opheim to Glasgow Highway | 1,039 |
| State Highway 13 | 1,101 |
| Flaxville to Poplar Highway | 1,115 |
| Burlington Northern | 1,156 |
| State Highway 16 | 1,157 |
| MT State Highway 50 | 1,181 |
| ND State Highway 85 | 1,205.5 |
| Great Northern Railroad | 1,238 |
| ND State Highway 2 | 1,240 |

### Recreation

This alternate segment avoids attractive and highly used recreational areas between the Continental Divide and Canyon Ferry Reservoir; both segments cross the Continental Divide National Scenic Trail. The alternate makes two additional crossings of the Lewis and Clark National Historic Trail (near Lincoln and Great Falls).

Other recreational activities would be impacted in similar ways for both the proposed and alternate route.

### Social and Economic Conditions

Population

The work force during peak construction periods in Cascade, Chouteau, Blaine, Phillips, Valley, Daniels, Sheridan, and Roosevelt Counties is provided in table 9.4-51. The estimated work force during construction or operation would not significantly affect county population totals.

Infrastructure

No significant adverse impacts would occur on infrastructural components.

Social Well-Being and Quality of Life

Negative effects on indicators of quality of life would occur from implementation of the proposed alternative. During construction rural land owners would have to adjust to construction activities. Their life styles would be altered temporarily. Construction activities, with associated noise, dust, and traffic pattern changes, would affect residential perceptions of the aesthetic setting, quality of air, and the region "as a place to live" during the construction phase. However, these would not be significant adverse impacts.

## HELMVILLE-LEWISTOWN-MOSBY, MONTANA

The Montana Department of Natural Resources proposed a short segment from Great Falls on the Helmville-Tioga alternative to Mosby on the proposed route. For comparison of the alternative to the proposed route, this analysis will pertain to the complete route alternative from Helmville to Great Falls and then to Mosby (see figure 9.4-14).

This route segment begins near Helmville, leaving the proposed route at pipeline mile 597, continuing northeast to a point south of Great Falls, then east past Lewistown, ending at Mosby, pipeline mile 875 (figure 9.4-14). Total distance for this segment would be 334 miles as compared to 278 miles for the proposed route.

### Climate

No impacts on climate would be expected.

### Air Quality

Air quality impacts would be about the same as those for the proposed route.

### Noise

Noise impacts would be about the same as those for the proposed route.

## Topography and Geology

Between pipeline mile 597 and Birdtail Butte (alternative route pipeline mile 685) topography and geology was previously discussed. From Birdtail Butte to the end of the segment near Mosby this route would cross terrain characterized by well-dissected badlands with moderate to gentle slopes and numerous north and northeast trending drainages. As the terrain is not quite as steep as that encountered by the proposed route resultant impacts, consisting of permanent landform changes, would be slightly less severe, generally ranging from 12 to 15 acres per mile (depending upon slopes).

Geologic material crossed by this route would be much the same as that encountered along the proposed route--Precambrian metasediments, Paleozoic and Mesozoic marine sediments, Tertiary nonmarine sediments, Quaternary glacial debris, etc. Geologic impacts--consisting of the removal of large volumes of geologic material (6,600 to 100,000 cubic yards per mile) and some change in the physical characteristics of the geologic material (porosity, permeability, moisture content, etc.)--would be slightly less due to the slightly gentler terrain.

### Geologic Hazards

Like the Helmville-Tioga alternative route, this route alternative would cross an area exhibiting two levels of seismic activity, a region of moderate activity corresponding to a Seismic Risk Zone 2 (moderate earthquake damage expected) located along the western portion of the route up to about Lewistown Segment pipeline mile 820 and a region of low activity corresponding to a Seismic Risk Zone 1 (minor earthquake damage expected) located between Lewistown Segment pipeline mile 820 and the end of the segment near Mosby (Lewistown Segment pipeline mile 930). As the proposed pipeline would cross an area of high seismic activity corresponding to a Seismic Risk Zone 3 (major earthquake damage expected) located in the vicinity of Helena in addition to regions of moderate (Seismic Risk Zone 2) and low (Seismic Risk Zone 1) seismic activity, the potential impacts from ground shaking would be greater along the proposed route. Like the Helmville-Tioga alternative, no active or potentially active faults or specific locations of potential liquefaction problems have been identified along this route alternative. While active or potentially active faults and zones of potential liquefaction problems might exist, the lower level of seismic activity would result in lower impacts than the proposed route.

Slope instability and outburst flood hazards might exist but no specific locations have been identified. An assessment of comparative impacts is not possible.

## Soils

Construction activity would disturb and alter soils on 3,370 acres of pipeline route right-of-way, compared to 2,836 acres for the proposed route.

Soils data are insufficient to make accurate and reliable comparisons of resources and potential impacts. The following analysis is based on data from a generalized reconnaissance soil survey published in 1953.

The route segment alternative crosses the Rocky Mountains physiographic region and the Great Plains physiographic region. Most of the route would be within the Great Plains region. Loam surface textures and clayey subsoil textures predominate. More than 30 soil series would occur along the route. The Pierre, Cheadle, Morton, and Lismas series appear to be the most prevalent. The Pierre and Lismas, as well as other soils, are high in clay content and are very difficult to revegetate. About 545 acres would fall into this category.

About 35 percent of the soils are rated fair to good for crop production under dry or non-irrigated conditions. Additional lands now marginal for farming would be fairly well suited to irrigated agriculture.

Removal of protective cover during construction would leave about 2,160 acres vulnerable to moderate and high soil losses from water erosion. Annual soil losses on long, steep slopes could exceed 45 tons per acre and would continue until vegetation was re-established. Effective revegetation would reduce soil losses to less than 5 tons per acre per year. About 250 acres would be highly susceptible to wind erosion until effective soil cover was re-established. Light soil blowing could also occur on the predominately loamy soils during the same period.

Other soil impacts would be similar to those along the proposed route segment.

## Aquatic Resources

### Physical Components

The largest streams crossed along this route segment would be Nevada Creek, Blackfoot River (three crossings), Dearborn River, Missouri River, Smith River, Belt Creek, Judith river, and Musselshell River. Nevada Creek and the Blackfoot River are tributary to the Clark Fork River, the other streams are tributary to the Missouri River. Several smaller streams would also be crossed. Water quality and discharge data have not been identified for streams along this route. Groundwater resource information has not been identified along this route.

Construction of a trench across the streambed would disturb sediments which would temporarily degrade water quality downstream from each crossing. Erosion from streambanks could contribute sediment to streams until revegetation occurs. An oil spill would degrade water quality for several miles downstream. Impacts on surface water resources along this route segment would probably be less significant than those along the proposed route.

### Biological Components

Fisheries resources have not been identified along this route segment; however, a few streams probably support one or more trout species, while many streams probably support warm water species including northern pike, walleye, catfish, sauger, perch, and crappie. Nearly all streams support forage fish such as minnows and sculpins.

Construction in the streambed and erosion from the streambank would contribute sediments which could damage trout spawning areas and reduce trout populations.

Streambank erosion could continue until vegetation becomes reestablished. Since spawning areas have not been identified, it is not known to what extent trout population would be reduced. An oil spill could reduce fish and aquatic insect populations for many miles downstream from the spill site. Recovery of reduced fish populations resulting from sedimentation or an oil spill could take several years. Impacts on fisheries resources along this route segment would probably be less significant than those along the proposed route.

Terrestrial Vegetation

This study corridor traverses 63 miles of the Douglas-fir ecoregion and 271 miles of the grama-needlegrass-wheatgrass ecoregion. Descriptions of these regions can be found in chapter 2.

This alternative route is approximately 56 miles longer than the comparable segment of the proposed route, thus requiring an additional 611 acres of land, assuming a 90-foot-wide construction corridor and flat terrain.

The initial 88 miles of this alternative is identical to that of the Helena-Tioga Alternate. The remaining 256 miles of pipeline corridor traverses vegetation comparable to the replaced segment of the proposed route, and impacts would be of the same general character as discussed in chapter 3.

The War Horse National Wildlife Refuge (pipeline mile 890) is located approximately 3 miles west of the corridor and is an important refuge for migratory waterfowl. No impacts to the vegetation of the refuge would occur during construction and normal operations. In the event of a major oil spill in the area, there is a remote possibility of damage to portions of the refuge.

No federally proposed threatened or endangered species are known to occur in the area traversed by the study corridor.

Terrestrial Wildlife

Impacts to wildlife from construction of a pipeline in this corridor would be of the same general character as discussed for the comparable segment of the proposed route in chapter 3.

Areas of special concern for the initial 88 miles of this segment are the same as those discussed for the initial leg of the Helen-Tioga Alternate.

This segment of the route encounters habitat for two endangered species, the bald eagle and the peregrine falcon, and two threatened species, the grizzly bear and the northern rocky mountain wolf.

The only areas of special concern identified along the remaining 271 miles of this alternative are waterfowl nesting areas along the Missouri River (pipeline mile 704) and in the War Horse National Wildlife Refuge (pipeline mile 890). Construction noise, dust, and associated activities could cause reduced nesting activity or abandonment of nests if pipeline installation occurs during the nesting season. Aerial surveys of the pipeline every 2 weeks for the 20-year life of the project would not be likely to disrupt waterfowl nesting activity if fixed-wing aircraft flying at an altitude of over 1,000 feet are used. Waterfowl are not expected to become habituated to the aircraft.

During operation of the system, the potential for oil spills within these critical areas exists. Should a spill occur near the War Horse NWR, it is unlikely that it would reach the refuge and directly impact the waterfowl. However, indirect impacts such as loss of feeding areas might be serious. It is also possible that a large pool of oil on snow or ice would attract waterfowl because it appears to be an open body of water (Barry 1970). This would potentially impact large amounts of waterfowl if the spill occurred during migration and was not detected for several days. Impacts to waterfowl from oil soaked feathers are widely known.

A spill within the Missouri River would destroy large amounts of shoreline vegetation used as nesting habitat, as well as directly impact waterfowl due to coating of feathers and ingestion of oil contaminated food.

The endangered whooping crane migrates through Montana, and thus might be affected by a spill. However, no nesting sites are known, so construction and normal operations are not expected to impact the species.

In certain areas, prairie dog towns might be encountered; however, no map is available showing their distribution. These towns provide habitat for the endangered black-footed ferret. Because of the nocturnal nature of this species, no accurate assessment of its distribution is available. Therefore, all prairie dog towns are considered potential habitat for the ferret.

Cultural Resources

The area crossed by this route segment alternative has not been investigated for the purpose of identifying cultural resource sites.

Visual Resources

Visual impacts for this alternate would be similar to the Helmville, Great Falls, Tioga alternate except for the crossing of Interstate 15 and the Missouri River--which could have a significant visual impact.

Land Use

Land use impacts would be similar to those which would occur on the proposed route.

Transportation and Utility Networks

This alternate route would have seven major highway crossings and four railroad crossings. Table 9.4-45 lists specific highway and railroad crossings and alternate pipeline mile locations. Construction and operation impacts at these crossing would be similar to those of the proposed route.

TABLE 9.4-45 RAILROAD AND HIGHWAY CROSSINGS

| Highway or Railroad Crossings | Alternate Pipeline Mile |
|---|---|
| U.S. Interstate 15 | 703 |
| Great Northern Railroad | 703 |
| State Highway 89 | 706.5 |
| State Highway 87 | 750 |
| Great Northern Railroad | 750 |
| Stanford to Arrow Cr. Highway | 789 |
| Chicago-Milwaukee-St. Paul and Pacific Railroad | 800.5 |
| Chicago-Milwaukee-St. Paul and Pacific Railroad | 838 |
| State Highway 191 | 863 |
| State Highway 191 | 869 |
| State Highway 20 | 921.5 |

## Recreation

This alternative segment would avoid the attractive and highly used recreational areas between the Continental Divide and the Canyon Ferry Reservoir; both segments cross the Continental Divide National Scenic Trail. This alternate segment makes two additional crossings of the Lewis and Clark National Historic Trail (near Lincoln and Great Falls). Other recreational activities would be similarly impacted by both the proposed route and the alternate route segment. Both proposed alternate segments make two crossings of the Lewis and Clark National Historic Trail.

## Social and Economic Condition

### Population

Peak construction work force estimates for Lewis and Clark, Cascade, Judith Basin, Fergus, and Petroleum Counties are provided in table 9.4-51. The number of persons who would accompany this work force into the counties would not significantly affect county population totals. The work force during the operation phase of the proposed project would not significantly affect population projections.

### Infrastructure

No significant adverse impacts would occur on infrastructural components of these counties during the construction or operation phases of the proposed alternative.

Bureau of Land Management

### Social Well-Being and Quality of Life

Negative effects on indicators of the quality of life would occur from implementation of the proposed alternative. During construction rural landowners would have to adjust to construction activities. Their life styles would be altered temporarily. Construction activities with associated noise, dust, and changes in traffic patterns would affect residents' perceptions of the aesthetic setting, quality of air, and the region "as a place to live" during the construction phase. However, these would not be significant adverse impacts.

## HARLOWTON-BEACH-CLEARBROOK

NTPC originally designated this segment as the proposed route but then changed to a northern alternative which parallels the Portal Pipeline right-of-way across North Dakota and Minnesota. Therefore this route segment is considered an alternative.

This alternative route segment begins at Harlowton, Montana, near pipeline mile 757 and travels in a northeasterly direction (fig. 9.4-1). The route enters North Dakota 5 miles south of Beach and crosses, northeasterly, rolling farm and grazing lands. Near Medora, the route crosses the Little Missouri National Grassland and the Little Missouri River. The route continues northeasterly from Medora, crossing Interstate 94 between Belfield and Dickinson and crosses the Missouri River about 15 miles north of Bismarck. A few miles east of the Missouri River, the route enters the "Pot Hole" or lake country. This area contains many lakes and wetlands and extends approximately 40 miles along the route. From the Kidder-Stutsman County line, the route continues in a northeasterly direction over level to rolling farmland, entering Minnesota near the town of Shelly on the Red River. The route traverses northern Minnesota for approximately 70 miles to the Clearbrook Delivery facilities, for a total distance of 692 miles compared to 735 miles for the proposed route

### Climate

No impacts on climate are anticipated for this alternative pipeline route.

### Air Quality

Air quality impacts would be similar to those for the other alternative route segments. During construction fugitive dust might be a problem under dry, windy conditions, causing localized high particulate levels.

### Noise

Noise impacts would be similar to those for the other alternative route segments. Since this alternative route traverses mostly rural areas, only scattered residences and some small residential areas would be affected by noise.

### Topography and Geology

This route segment alternative like the proposed route from the eastern boundary of Meagher County, Montana (pipeline mile 757) to the terminus at Clearbrook, Minnesota, is characterized by rolling hills, some highly dissected badlands, and hummocky glacial plains with numerous small glacial lakes. It does, however, contain longer stretches of badland topography (e.g., the Little Missouri River "breaks"). Consequently, topographic impacts, consisting of minor landform changes and drainage alterations, would be slightly greater than those along the proposed route.

Geologic material found along this route segment alternative would be essentially the same as along the proposed route, consisting of Cretaceous and Tertiary sediments, Quaternary glacial debris, and Quaternary alluvium. Consequently, impacts on the geologic material, consisting of the removal of large volumes of material and minor changes to their physical characteristics, would be the same.

### Geologic Hazards

As both routes would traverse an area of low seismic activity corresponding to a Seismic Risk Zone 1 (minor earthquake damage expected), containing no known active or potentilly active faults, anticipated seismic impacts would be the same.

Since this route segment alternative would cross terrain that is slightly steeper overall, particularly along the Little Missouri river (segment pipeline mile 306 to 335), a greater number of sites exhibiting potential slope instability problems have been identified--Sumatra (Harlowton alternate pipeline mile 125 to 127), Sand Creek (segment pipeline 205 to 207), Hunter Creek (segment pipeline mile 206 to 208), Bluffords (segment pipeline mile 271 to 272), South Fork Horse Creek (segment pipeline mile 284 to 291), the Little Missouri (segment pipeline mile 314 to 315 318 to 322, 326, 329 to 335, and 463), the Missouri River (segment pipeline mile 452), and Grass Creek (segment pipeline mile 463). Consequently, the anticipated impacts from slope instability would be greater than those along the proposed route.

### Mineral Resources

Although the proposed pipeline route would cross a portion of the Avoca coal field (Tioga, North Dakota) and Reserve coal fields (Reserve, Montana), this route segment alternative would cross the Wibaux coal field (Wibaux, Montana), which has a much greater development potential. Consequently, anticipated impacts would be greater along this route segment alternative. There is no significant difference in the impacts to other mineral resources found along these two routes.

### Soils

The silty clay or stony silt loam soils of east-central Montana would receive slight to moderate impacts. Wind-induced erosion would occur on approximately 650 acres because of temporary loss of vegetative cover. Soil loss from water erosion would be in the range of 6 tons per acre per year without protective vegetation and about 0.30 tons per acre per year with revegetated native grass.

Soils of the eastern Montana part of the route are primarily silty clay loams and silt loams. Areas of badlands with shaly, silty clay soils would be highly erosive. Such areas are dissected by numerous drainage channels and short steep slopes.

Exposed surfaces would lose an average of 21 tons of soil per acre per year that could be reduced to 1.2 tons per acre by revegetation with native grasses. About 550 acres within the right-of-way would be susceptible to moderate impact from wind-induced erosion.

Soils in the approximate western third of the route through North Dakota are shallow over soft sandstone and shale bedrock. Erosion, from both wind and water would be the major impact on the soils of this region. Soil losses from water erosion would average about 7.0 tons per acre per year without protective vegetation and 0.4 tons per acre per year after revegetation was complete. Moderate wind erosion losses would occur on approximately 300 acres within the pipeline right-of-way.

The route through central North Dakota traverses deep, well-drained soils, with loam, silt loam, and silty clay loam textures. Slopes are undulating to hilly. Average annual soil losses would be approximately 8 tons per acre in the absence of protective vegetation and about 0.4 tons per acre when vegetation is reestablished.

Soils of eastern North Dakota range in texture from fine sandy loam to silty clay loam. Surface relief is nearly level to undulating. Extensive areas are wet for several months at a time. Severe wind erosion occurs on the medium- and coarse-textured soils. About 60 acres would be affected. Soils of the Hamerly and Ulen series have high lime layers in the subsoil. Failure to segregate topsoil during trenching operations would result in reduced productivity. Gumbo spots have formed in some areas. These are small areas where the plow layer is soft and sticky when wet and very hard or extremely hard when dry because fine-textured, saline material from the subsoil has been mixed into the plow layer. Careful segregation and replacement of topsoils would be needed to avoid adverse impacts that would persist for many years. Impacts from water erosion with removal of vegetation would be less than 5 tons per acre per year.

In Minnesota the proposed route would traverse relatively flat, locally hummocky, terrain. The soils are mostly silty clay loams and silty clays. About 16 percent of the route has medium- and coarse-textured soils. Seasonally wet soils are those of the Fargo, Cashel, Colvin, Hegne, Shooker, Gonvick, and Flom series. Trenching activities in these soils in a saturated condition would adversely alter soil structure and reduce productive capacity for several years. Wind erosion susceptibility would be severe on about 120 acres. Soil losses by water erosion would be well below 5 tons per acre per year.

Impacts caused by soil compaction, soil profile mixing, and potential oil contamination would be fairly constant along the entire route segment. Soil compaction, except for the wet areas previously described, would cause temporary loss in soil productivity of 5 to 10 percent. Effects of compaction would last for about 2 years. These glacial and lacustrine soils have relatively thick, fertile topsoils. Segregation of only a standard 12-inch top layer would result in the replacement of some fertile soil material too deeply in the trench.

Impacts from potential oil spills would be similar to those aloong the proposed route.

## Aquatic Resources

### Physical Components

This alternate route segment crosses 15 major and over 300 minor streams within the Missouri River and Hudson Bay Basins. Major rivers that would be impacted by pipeline construction and potential oil spills include the Musselshell, Yellowstone Little Missouri, Heart, Green, North Branch Knife, South Branch Knife, Missouri, James, South Branch Goose North Branch Goose, Red, and Sandhill Rivers. In general, seasonal variations of streamflow occur. Peak runoff periods are in spring from rapid snowmelt; low flow periods occur in winter. Many of the smaller streams will cease flowing during the heat of the summer, and also during winter freeze. The Canyon Ferry and Fort Peck reservoirs limit seasonal variation of flow on the main stem of the Missouri. Water chemistry of surface waters varies from sodium-sulfate to calcium-bicarbonate type with moderately low to high dissolved-solids concentrations.

Ground water sources that could be impacted from construction and/or operation of the pipeline include the border, Great Plains, and central lowland regions. Aquifers most vulnerable to impact are generally shallow, unconfined, alluvium and terrace gravel deposits recharged by precipitation and/or stream runoff. The Fort Union and Lance formations are the most significant ground water sources along the alignment. Several towns including Roundup, Dickinson, Belfield, and Richardton use ground water for municipal supplies.

Impacts to hydrologic resources would result from construction and operation of the pipeline. Suspended sediment and siltation impacts would occur at and downstream of river crossing locations. Within about 1 month of construction the river should reduce its sediment load to preconstruction amounts. Hydrostatic test water would be withdrawn from surface waters along the alignment. A short-term decrease in baseflow would occur during withdrawal periods. Inadvertent discharge of hydrostatic test water could adversely impact receiving areas. If test water were of lesser quality than receiving areas, surface or ground water degradation would occur. Construction in shallow ground water regions would require trench dewatering. Ground water movement and water level would be impacted. Normal operation of the pipeline would have no major adverse impact. However, in the event of a pipe rupture, oil would be spilled and surface and/or ground water resources would be impacted. Water quality degradation would occur. Refer to chapter 3 Aquatic Resources--Physical Components, for a more detailed discussion of impacts.

### Biological Components

Streams along this corridor support warm water fishes. The most important sport species, including walleye, sauger, northern pike, catfish, perch, bass, and the sunfishes, are present in the majority of the larger streams along this route. In addition, the following concerns regarding specific rivers are noted:

Yellowstone: Important locally and regionally for sport fishing.

Little Missouri: Critical spawning area for the channel catfish populations of Lake Sakakawea are 15 miles downstream from crossing.

Heart: Important walleye and sauger spawning area downstream from crossing.

Green: Numerous springs and beaver dams assure fish survival in dry periods. Source of bait minnows for local sport anglers.

Knife: Good reproduction of sport and forage fishes.

Missouri: Highly valued sport fishery is considered one of the finest in Great Plains area.

James: Highly valued locally for its sport fishery.

Cheyenne: Highly valued sport fishery. Commercial fishery for bullheads, white suckers, and yellow perch in Lake Ashtabula, 15 miles downstream.

Sediment-related impacts would generally be expected to be minor to warm water fishery resources along this alternative route since most warm water species are adapted to waters containing high suspended sediments.

The greatest impacts would result from an oil spill that could reduce fish populations for several miles downstream from the spill site. The actual extent of oil exposure to fishery resources would depend on leak volume, detection and shutdown times, and on the stream characteristics at the time of the spill. Eggs, larvae, juveniles, and adult fish would be vunerable. The severity of impacts downstream could range anywhere from minor losses to the complete elimination of fish populations if spill volumes and oil concentrations were high, to no detectable losses if spill volumes and oil concentrations were low. If a large percentage of a specific fish population was eliminated, it might take several years to fully recover to prespill population numbers. Oil would be flushed out of streams quite rapidly but is likely to remain in downstream impoundments such as Lake Sakakawea and Lake Ashtabula for several months. Fish populations in these and similar impoundments would be expected to suffer greater losses than fish populations in streams. Impacts to fisheries along this alternative segment would be greater than those associated with the proposed route. See chapter 3 for a more detailed analysis of impacts.

Terrestrial Vegetation

In predominant grassland vegetation on the eastern half of Montana the initial short-term effect of construction would be less dramatic. Lower rainfall and higher evaporation rates would make revegetation more difficult. Potential for long-term negative impact on vegetation would be substantial.

Wetlands could have both long- and short-term significant adverse impacts resulting from construction caused siltation and drainage.

An oil spill would result in significant adverse impacts to vegetation if it occurred along riparian or wetland habitats. The specific impacts of an oil spill have been discussed in chapter 3.

In North Dakota, both short- and long-term impacts would stem from construction of the proposed pipeline. Badland and western grassland vegetation would be slow and difficult to reestablish because of the very low rainfall, about 10 inches per year (Shaver 1977). The low precipitation combined with high temperatures, high evaporation rates, and wind and water erosion would cause the terrestrial habitat to be sensitive to most physical disturbances. It is probable that long-term erosion would occur in the badlands and other western areas where slopes are steep, unstable, or stable only because of vegetative cover. After clearing, surface runoff and resulting erosion would increase and moisture infiltration would decline. Reduced soil moisture would further reduce the probability of successful revegetation. The impact on vegetation-wildlife habitat would be substantial in the badland-western grassland area of the state.

Riparian wetlands could also suffer a loss in productivity from increases in turbidity and silt loads caused by pipeline construction across streams. Accumulation of silt deposits form a soft semiliquid substrata inadequate for the anchoring of roots (Water Quality Criteria 1972). Blanketing of plants and sessile animals with sediment can cause drastic changes in aquatic ecosystems. If sedimentation covers substantial amounts of organic material, anaerobic conditions could produce noxious gases, low dissolved oxygen, and decreases in pH (Water Quality Criteria 1972).

Films of oil on the water surface might interfere with reaeration and photosynthesis. These impacts from an oil spill would mean a reduction in the productivity of the wetland habitat for mammals, waterfowl, and shorebirds as discussed in chapter 3.

Construction across the James River would increase siltation; deposition of this silt in the Arrowwood Wildlife Refuge could reduce productivity of these wetlands.

Most of the negative impacts on vegetation in Minnesota resulting from construction activities would be short-term. With revegetation, most negative impacts would cease. Overall adverse impacts would be insignificant because most of the land crossed by the proosed project are agricultural. Locally significant impacts would result from oil spills on riparian, wetland, or natural areas.

Selection of this alternative segment would result in the clearing of an estimated 2,844 acres of grassland-range, 48 acres of forest land, 607 acres of wetland, and 226 acres of riparian vegetation. Approximately 41 acres of forest land, 505 acres of wetland habitat, and 190 acres of riparian habitat would be maintained free of mature trees.

Locations of officially designated endangered or threatened species within the alternate pipeline corridor are not known at this time.

No known officially designated critical habitats occur within the proposed corridor in North Dakota.

No officially designated critical habitats are known to be crossed by the proposed project in Minnesota. However, the Agassiz Dunes Natural Area, owned by the Nature Conservancy and nominated as a unit in the Minnesota Department of Natural Resources Scientific and Natural Area Program, would be crossed by the pipeline. Construction impacts on natural vegetation could be locally significant. Burning, part of the area's management program to maintain existing vegetation, might not be compatible with pipeline operation.

Terrestrial Wildlife

Construction activities could reduce waterfowl habitat and production in areas near Lake Mason National Wildlife Refuge and Charles Russell National Wildlife Refuge. Marsh drainage and disturbance of nesting and staging areas could cause abandonment of nests and a concommitant short-term loss of the waterfowl harvest along the borders of these wetlands. Except for the prairie pothole region in North Dakota, disturbance impacts would generally be minor and short-term. However, any wetland drainage would represent a permanent loss of waterfowl habitat. Waterfowl concentrations in the prairie pothole region involve approximately 245 miles of corridor.

Unknown numbers of grouse and other shrub dependent species occur throughout the corridor. Specific areas of concern include the disturbance of sage grouse strutting grounds near Dry Creek and Nelson Creek, and sharp-tailed grouse dancing grounds near Timber Creek in McCone County; other important ground habitats occur near Williston, Stanley, and Essex. Impacts from disturbance would be low and of short duration unless vegetation was radically altered.

Prime pheasant and white-tailed deer habitat would be disturbed along the Flat Willow stream crossing in Petroleum County, Montana, and at other minor stream crossings. Removal of riparian habitat is expected to be short-term with minimal effects on wildlife.

Prairie dog towns occur near the Charles Russell National Wildlife Refuge and may provide suitable habitat for the black-footed ferret, an endangered species, although no ferrets have been identified in the area.

Cultural Resources

The cultural resource sites listed below would potentially be affected on this route segment alternative. Specific localities of known paleontological resources have been identified only for the North Dakota portion of this alternative. There is high potential for discovery of additional archaeological, historical and paleontological sites all along this route segment alternative.

The currently known prehistoric, historic and paleontologic sites are listed in tables 9.4-47, 9.4-48, and 9.4-49.

Potential impacts to the known sites and to any presently unrecorded archaeological, historical, and paleontological sites would be the same as those discussed in chapter 3.

Sharp-tailed grouse U.S. Fish and Wildlife Service

## TABLE 9.4-47 KNOWN PREHISTORIC ARCHAEOLOGICAL SITES

| County, State | Site Number | Site Name | Site Type | Approximate Pipeline Mile from Near Harlowton |
|---|---|---|---|---|
| Montana | | | | |
| Musselshell | 24ML414 | | Burial | 60 |
| Musselshell | 24ML564 | Start Bison Kill | Bison kill site | 60 |
| Musselshell | 24ML130 | | Rock circles | 60 |
| Musselshell | 24ML119 | | Bison surround | 103 |
| Prairie | 24PE14 | | Campsite | 237 |
| Prairie | 24PE12 | | Chipping Station | 239 |
| Prairie | 24PE10 | | Occupation | 239 |
| Prairie | 24PE11 | | Occupation | 239 |
| Prairie | 24PE 7 | | Occupation | 243 |
| Prairie | 24PE 8 | | Occupation | 243 |
| Prairie | 24PE 9 | | Occupation | 243 |
| Prairie | 24PE 6 | | Occupation | 243 |
| Prairie | 24PE18 | Ash Coulee Village | Occupation | 252 |
| Wibaux | 24WX1001 | | Quarry | 300 |
| North Dakota | | | | |
| Stark | 32SK105 | | Habitation | 376 |
| Stark | 32SK108 | | Occupation | 376 |
| Stark | 32SK107 | | Bison jump and occupation | 377 |
| Stark | 32SK104 | | Habitation | 377 |
| Oliver | 32OL406 | | Lithic scatter | 436 |
| Oliver | 32OL404 | | Lithic scatter | 442 |
| Oliver | 32OL405 | | Lithic scatter | 442 |
| Oliver | | | Rock cairn | 448 |
| Oliver | | | Tipi rings, turtle & horse head effigies | 457 |
| Oliver | 32OL104 | | Mound | 457 |
| Oliver | | | Mound | 457 |
| Griggs | 32GG228 | | Linear mounds | 600 |
| Griggs | 32GG227 | | Campsite | 600 |
| Griggs | 32GG235 | | Campsite | 600 |
| Griggs | 32GG232 | | Campsite | 600 |
| Griggs | 32GG231 | | Campsite | 600 |
| Griggs | 32GG233 | | Campsite | 600 |
| Minnesota | | | | |
| Polk | PL-6 | Warner Mounds | Burial mounds | 680 |
| Polk | Pl-4 | | Burial Mound | 682 |
| Polk | Pl-2 | | Village site | 688 |

## TABLE 9.4-48 HISTORICAL SITES

| County, State | Site Number | Site Name | Site Type | Approximate Pipeline Mile from Near Harlowton |
|---|---|---|---|---|
| Montana | | | | |
| Wheatland | | Trail followed by Gen. Howard in pursuit of Nez Perce, Sept.1877 | Military and Native American | 1 |
| Wheatland | | Trail followed by Nez Perce enroute to Judith Gap | Military and Native American | 25 |
| Golden Valley | | Stage Road from Billings to Great Falls | | 35 |
| Golden Valley | | Stage Road from Billings to Fort Benton | | 48 |
| Golden Valley | | Havercamp Homestead | Social | 56 |
| Musselshell | | Trail followed by Lts. Doane and DeRudio and Crow scouts, from Ft. Keogh to Judith Gap | Military and Native American | 106 |
| Rosebud | | Trail followed by Col Miles enroute to Snake Creek Battle-field, and on his return to Fort Keogh with Nez Perce captives | Military and Native American | 191 |
| Prairie | | Sheridan Butte | Military | 242 |
| Prairie | | William George grave | Military burial | 244 |
| Prairie | | Mouth of the Powder River | Landmark related to exploration, fur trade, military and Native American history | 244 |
| Prairie | | Gen. Terry's Supply Camp | U.S. military | 244 |
| Prairie | | Historic graves | Social | 244 |
| Prairie | | Powder River Station of the Fort Keogh to Bismarck Stage Line; 1878-1881 | Technology/social military | 244 |
| North Dakota | | | | |
| Golden Valley | | Porter Coal Mine | Industrial | 317 |
| Golden Valley | | Sully's Water Hole Camp | 19th century military campsite | 330 |

TABLE 9.4-48 (Continued)

| County, State | Site Number | Site Name | Site Type | Approximate Pipeline Mile from Near Harlowton |
|---|---|---|---|---|
| North Dakota (Cont.) | | | | |
| Golden Valley | | Sully Campsite (Mud Hole) | 19th century military campsite | 330 |
| Billings | | Maltese Cross Ranch Cabin | Political/ ranching | 334 |
| Billings | | Custer Trail Ranch | Military/ranching | 336 |
| Billings | | Custer Trail Ranch Hq. | Military/ranching | 336 |
| Billings | | Custer Camp | Military | 336 |
| Billings | | Sully Expedition campsite | Military | 336 |
| Billings | | Custer Camp | Military | 336 |
| Billings | | Demores Stage line | Transportation | 340 |
| Billings | | Sully Springs | Military | 342 |
| Stark | | Fort Houston | Military | 352 |
| Stark | | Pittsburg Coal Mine | Industrial | 357 |
| Stark | | Zenith Coal Mine | Industrial | 357 |
| Stark | | Custers Historic Trail | Military | 357 |
| Stark | | Wiley Coal Mine | Industrial | 361 |
| Stark | | Custer Camp | Military | 364 |
| Oliver | | Flint Coal Mine | Industrial | 436 |
| Oliver | | Pleasant Valley Coal Mine | Industrial | 441 |
| Oliver | | Tripp Coal Mine | Industrial | 451 |
| Oliver | | Aster Post Office | Settlement | 453 |
| Oliver | | Lewis & Clark Site | Exploration | 460 |
| McLean | | Sts. Peter & Paul Greek Orthodox Catholic Church | Religion and Architecture | 468 |
| Burleigh | | *Soo Line Depot, Wilton | Railroad history | 469 |
| Burleigh | | Andrews/Canfield Post Office | Settlement | 484 |
| Foster | | Melville Townsite | Social/settlement | 553 |
| Griggs | | Camp Pope | | 592 |
| Traill | | Rural School | Social/educational | 638 |
| Traill | | Rural School | Social/settlement | 651 |
| Traill | | Caledonia Townsite | Social/settlement | 654 |
| Minnesota | | | | |
| Polk | | Old Grist Mill | Commerce/industry | 685 |

* This site is listed in the National Register of Historic Places.

TABLE 9.4-49 PALEONTOLOGICAL SITES

| County | Site Type | Approximate Pipeline Mile From Near Harlowton |
|---|---|---|
| Billings | Plant fossils | 337 |
| Billings | Plant fossils | 342 |
| Billings | Plant fossils and microfossils | 342 |
| Burleigh | Microfossils | 461 |
| Burleigh | Invertebrate fossils | 470 |
| Burleigh | Invertebrate fossils | 474 |
| Stutsman | Invertebrate fossils and microfossils | 537 |

## Visual Resources

The proposed alternate route begins about 14 miles to the northwest of Harlowton and proceeds in a north-easterly direction. The topography is flat to rolling hills, covered by sagebrush and juniper, with deciduous trees and shrubs in the drainages. Most drainages are intermittent. The pipeline would cause minimal visual intrusion except for high visual impact during construction.

Short-term adverse visual impacts could be expected during construction. The visual impact would be reduced considerably within a short time, and remain low for the life of the project.

A massive oil-spill during operation could create high impact for a short time. Depending on extent of spill, recovery of land to agricultural quality would require about 2 to 3 years. Low visual impact would exist after the disturbed right-of-way had been revegetated.

## Land Use

This alternative route would have significantly less impact on urban land uses than the proposal because it would not be adjacent to any small communities; the proposed route is adjacent to 19 small communities. For other land uses, there would be approximately 570 acres less agricultural land and about 110 acres more rangeland disturbed by construction. In North Dakota, where land with prime farmland soils has been mapped by the Public Utilities Commission, this alternate route would have significantly less impact, approximately 465 acres within the construction right-of-way as opposed to 1,190 acres on the proposed route. However, tile drainage systems in Norman County, Minnesota, would be disturbed. The impacts would be as described in chapter 3.

This alternative route would have more adverse impacts on lands with special management concerns than would the proposed route. Both lands included and proposed for inclusion in the Lake Mason National Wildlife Refuge in Musselshell County, Montana, would be traversed by the pipeline as would several Waterfowl Production Areas (WPA) and U.S. Fish and Wildlife Service wetland easements in North Dakota and Minnesota. The U.S. Fish and Wildlife Service policy is to discourage uses of these areas which do not complement their primary function, which is waterfowl production. This alternative route would also conflict with Forest Service management guidelines for the National Grasslands as it would cross river breaks and river bottom ecosystems.

A potential adverse impact to wilderness resources might occur in Prairie County, Montana where the route would cross through an undeveloped area of public lands known as the Terry Badlands. This area is being studied by the Bureau of Land Management for its wilderness characteristics. Interim management would forestall pipeline construction or any other action which might detract from wilderness values.

This alternative would also adversely impact the Lake Aggasiz Dunes Natural Area in Polk County, Minnesota, and might be in proximity to several natural areas or potential natural areas in North Dakota.

Through North Dakota this route would conflict with local government guidelines by not following cadastral subdivision lines (north-south, east-west). Instead it would pass diagonally through the land ownership pattern and would not utilize existing transportation or utility corridors.

## Transportation and Utility Networks

The potential for adverse impacts to other transportation and utility systems would generally be reduced on this alternative route because of the fewer number of crossings and miles of parallel construction. However, near Center, North Dakota, the pipeline would be in proximity to a high voltage direct current (HVDC) transmission line, which under a ground fault condition, could induce dangerously high voltage to the pipeline. Aside from this hazard, which would require special engineering design to counteract, the impacts to other networks would be similar to those described in chapter 3.

Slightly less electric power would be needed for operation of the pipeline system on this route because of the 25 miles less distance required. This difference would not be significant in terms of regional power supplies and the amount of new electric transmission facilities required would be about the same as for the proposed route.

## Recreation

Recreation east of Harlowton is dispersed with few developed camp or destination sites. Big game is hunted throughout most of the area in eastern Montana. In addition, game birds are hunted in the vicinity of Roundup. The possibility of reduced game harvest, a result of construction and abandonment activities, would affect few recreationists because of the amount of hunting areas available. East of the Missouri River in North Dakota the Prairie Pothole lakes area is a valuable waterfowl resource. Several wildlife refuges are be in the vicinity of, or crossed by this alternative. Recreationists would experience a degraded resource as a result of the construction or abandonment activities. In the case of an oil pipeline leak or rupture, there might be permanent loss of portions of the resource in the Prairie Potholes region.

Angler pressure is variable. Streams of importance to sport fishers are the Yellowstone River, James River, Missouri River, and Cheyenne River. Anglers and other recreationists in the Dickinson vicinity who fish or otherwise enjoy the Heart River or Patterson Lake might find a lower quality resulting from use by construction crew members. Visitor use of Patterson Lake was 192,000 recreation days in 1975.

Recreationists using the Theodore Roosevelt Memorial Park (South Unit), or travelling through North Dakota to view the National Grasslands (see Map Addendum for locations) would experience degraded vistas and lessened quality as a result of the pipeline corridor.

Recreation in Minnesota is mainly fishing, hunting, and water related sports. The numerous fields available for hunting and lakes for fishing and other water-related recreation in western Minnesota would make any losses to these activities as a result of pipeline construction operation and abandonment activities minor and similar to those of the proposed route.

## Social and Economic Conditions

Counties through which the pipeline would pass are identified in table 9.4-50. The counties which would sustain social and economic impacts during construction are identified in tables 9.4-50 through 9.4-54.

Impacts to these counties would be similar to those sustained in the counties impacted by the proposed route. Temporary increases in population would occur during construction from influxes of construction workers and workers in other industries and their families. The probable distribution of the construction work force is shown in table 9.4-51. These data are shown in terms of the number of man-months during each subdivision of the construction period. The data for the local construction work force represents workers living at home during their employment. Table 9.4-52 shows total employment including the additional employment generated in the area by construction activity, and table 9.4-53 shows the amount of personal income generated, including construction payrolls.

In Montana the following counties would sustain high construction impacts with temporary population increases in excess of 5 percent: Wheatland, Golden Valley, Petroleum, Musselshell, Rosebud, Custer, Dawson, and Wibaux. Impacts would be about the same in Wheatland County as those for the proposed route. They would be lower in Fergus, Petroleum, and Garfield Counties, but higher in the other counties listed in the tables than those for the primary route. Impacts in Custer and Dawson Counties would be increased in severity because of concurrent energy development activity in these counties.

In North Dakota, no counties would have temporary population increases in excess of 5 percent, however, impacts from pipeline construction would be high since they would coincide with coal development activities in Dunn, Stark, Mercer, Oliver, Morton, McLean, and Burleigh Counties.

In Minnesota, Norman, Clay, and Mahnomen Counties, none of which are impacted by the proposed route, would have minor construction impacts. Counties impacted by this alternate route would have similar or lower impacts than those for the proposed route.

## TABLE 9.4-50 TRANSIENT POPULATION BY CONSTRUCTION PERIOD

| COUNTY NO. | NAME | DEC.79-MAR.80 |  | APR.80-JUL.80 |  | AUG.80-NOV.80 |  | DEC.80-MAR.81 |  | APR.81-JUL.81 |  | AUG.81- END |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | MAX. | AVG. | MAX. | AVG. | MAX. | AVG. | MAX. | AVG. | MAX. | AVG. | MAX. | AVG. |
| 28 | LEWIS & CLARK | 0. | 0. | 389. | 262. | 1139. | 870. | 55. | 34. | 15. | 15. | 0. | 0. |
| 29 | JEFFERSON | 0. | 0. | 91. | 67. | 234. | 175. | 5. | 3. | 4. | 4. | 0. | 0. |
| 30 | BROADWATER | 0. | 0. | 406. | 369. | 407. | 183. | 3. | 2. | 5. | 5. | 0. | 0. |
| 31 | CASCADE | 0. | 0. | 32. | 20. | 50. | 46. | 38. | 22. | 3. | 3. | 0. | 0. |
| 32 | MEAGHER | 0. | 0. | 227. | 222. | 226. | 61. | 0. | 0. | 4. | 4. | 0. | 0. |
| 33 | JUDITH BASIN | 0. | 0. | 25. | 25. | 25. | 7. | 0. | 0. | 0. | 0. | 0. | 0. |
| 34 | WHEATLAND | 0. | 0. | 450. | 335. | 577. | 489. | 340. | 154. | 5. | 4. | 4. | 1. |
| 35 | FERGUS | 0. | 0. | 453. | 227. | 463. | 260. | 21. | 10. | 2. | 2. | 0. | 0. |
| 36 | GOLDEN VALLEY | 0. | 0. | 36. | 20. | 160. | 121. | 140. | 64. | 1. | 1. | 1. | 0. |
| 37 | PETROLEUM | 0. | 0. | 0. | 0. | 87. | 65. | 88. | 40. | 1. | 1. | 1. | 0. |
| 38 | MUSSELSHELL | 0. | 0. | 112. | 109. | 690. | 543. | 698. | 320. | 7. | 5. | 10. | 3. |
| 39 | YELLOWSTONE | 0. | 0. | 21. | 14. | 42. | 31. | 47. | 39. | 13. | 7. | 0. | 0. |
| 40 | GARFIELD | 0. | 0. | 23. | 23. | 23. | 7. | 0. | 0. | 0. | 0. | 0. | 0. |
| 101 | ROSEBUD | 0. | 0. | 564. | 504. | 569. | 259. | 13. | 8. | 0. | 0. | 8. | 2. |
| 102 | TREASURE | 0. | 0. | 46. | 45. | 46. | 14. | 0. | 0. | 0. | 0. | 1. | 0. |
| 41 | MC CONE | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 103 | PRAIRIE | 0. | 0. | 0. | 0. | 68. | 64. | 69. | 39. | 1. | 1. | 1. | 0. |
| 42 | CUSTER | 0. | 0. | 563. | 530. | 563. | 503. | 479. | 286. | 24. | 14. | 17. | 5. |
| 43 | DAWSON | 0. | 0. | 40. | 40. | 669. | 495. | 449. | 263. | 15. | 11. | 7. | 2. |
| 45 | RICHLAND | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 3 | MONTANA |  | 0. |  | 2774. |  | 4174. |  | 1274. |  | 40. |  | 15. |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 106 | GOLDEN VALLEY | 0. | 0. | 42. | 34. | 135. | 111. | 81. | 45. | 1. | 1. | 2. | 0. |
| 4 | N.DAKOTA |  | 0. |  | 34. |  | 111. |  | 45. |  | 1. |  | 0. |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 104 | WIBAUX | 0. | 0. | 120. | 115. | 206. | 148. | 47. | 26. | 1. | 0. | 1. | 0. |
| 105 | FALLON | 0. | 0. | 14. | 14. | 152. | 114. | 70. | 40. | 1. | 1. | 1. | 0. |
| 3 | MONTANA |  | 0. |  | 122. |  | 262. |  | 66. |  | 1. |  | 0. |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 107 | BILLINGS | 0. | 0. | 45. | 44. | 45. | 24. | 11. | 6. | 0. | 0. | 1. | 0. |
| 108 | DUNN | 0. | 0. | 45. | 44. | 45. | 16. | 0. | 0. | 0. | 0. | 1. | 0. |
| 109 | STARK | 0. | 0. | 862. | 801. | 866. | 378. | 23. | 12. | 2. | 1. | 8. | 3. |
| 110 | MERCER | 0. | 0. | 91. | 87. | 138. | 120. | 78. | 53. | 1. | 1. | 2. | 1. |
| 111 | OLIVER | 0. | 0. | 23. | 22. | 45. | 40. | 22. | 15. | 0. | 0. | 1. | 0. |
| 112 | MORTON | 0. | 0. | 97. | 89. | 294. | 235. | 211. | 145. | 10. | 7. | 4. | 1. |
| 113 | MC LEAN | 0. | 0. | 1. | 1. | 137. | 92. | 112. | 76. | 2. | 1. | 2. | 0. |
| 114 | SHERIDAN | 0. | 0. | 0. | 0. | 33. | 29. | 34. | 23. | 1. | 0. | 1. | 0. |
| 115 | BURLEIGH | 0. | 0. | 107. | 94. | 765. | 526. | 501. | 341. | 25. | 17. | 6. | 2. |
| 116 | WELLS | 0. | 0. | 112. | 110. | 87. | 52. | 44. | 30. | 1. | 1. | 3. | 1. |
| 117 | KIDDER | 0. | 0. | 67. | 66. | 53. | 28. | 22. | 15. | 0. | 0. | 2. | 0. |
| 118 | EDDY | 0. | 0. | 57. | 56. | 44. | 12. | 0. | 0. | 0. | 0. | 1. | 0. |
| 119 | FOSTER | 0. | 0. | 91. | 89. | 71. | 19. | 0. | 0. | 0. | 0. | 2. | 0. |
| 120 | STUTSMAN | 0. | 0. | 352. | 336. | 276. | 82. | 0. | 0. | 0. | 0. | 6. | 2. |
| 53 | RAMSEY | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 54 | NELSON | 0. | 0. | 68. | 66. | 53. | 14. | 0. | 0. | 0. | 0. | 1. | 0. |
| 21 | GRIGGS | 0. | 0. | 91. | 89. | 71. | 19. | 0. | 0. | 0. | 0. | 2. | 0. |
| 122 | BARNES | 0. | 0. | 223. | 212. | 177. | 54. | 0. | 0. | 0. | 0. | 4. | 1. |
| 55 | GRAND FORKS | 0. | 0. | 2. | 1. | 183. | 142. | 185. | 74. | 2. | 2. | 2. | 1. |
| 123 | STEELE | 0. | 0. | 68. | 66. | 58. | 31. | 22. | 9. | 0. | 0. | 2. | 0. |
| 124 | TRAILL | 0. | 0. | 0. | 0. | 67. | 54. | 68. | 27. | 0. | 0. | 1. | 0. |
| 125 | CASS | 0. | 0. | 14. | 9. | 193. | 155. | 193. | 78. | 3. | 3. | 2. | 1. |
| 48 | WARD | 0. | 0. | 0. | 0. | 3. | 1. | 4. | 4. | 2. | 1. | 0. | 0. |
| 4 | N.DAKOTA |  | 0. |  | 2255. |  | 2113. |  | 907. |  | 34. |  | 13. |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 56 | POLK | 0. | 0. | 7. | 7. | 215. | 178. | 213. | 84. | 2. | 2. | 3. | 1. |
| 126 | NORMAN | 0. | 0. | 0. | 0. | 65. | 52. | 66. | 26. | 0. | 0. | 1. | 0. |
| 127 | CLAY | 0. | 0. | 0. | 0. | 111. | 86. | 113. | 45. | 1. | 1. | 1. | 0. |
| 57 | RED LAKE | 0. | 0. | 6. | 6. | 30. | 17. | 11. | 4. | 0. | 0. | 0. | 0. |
| 128 | MAHNOMEN | 0. | 0. | 0. | 0. | 11. | 9. | 11. | 4. | 0. | 0. | 0. | 0. |
| 58 | CLEARWATER | 0. | 0. | 17. | 17. | 92. | 77. | 65. | 26. | 0. | 0. | 1. | 0. |
| 59 | BELTRAMI | 0. | 0. | 19. | 19. | 122. | 59. | 29. | 12. | 1. | 1. | 0. | 0. |
| 5 | MINNESOTA |  | 0. |  | 50. |  | 478. |  | 200. |  | 4. |  | 2. |

Typical of country from Ray to Lakota, North Dakota

Dakota Travel Department

## TABLE 9.4.51 CONSTRUCTION WORK FORCE BY CONSTRUCTION PERIOD

| COUNTY NO. | NAME | DEC.79-MAR.80 | | APR.80-JUL.80 | | AUG.80-NOV.80 | | DEC.80-MAR.81 | | APR.81-JUL.81 | | AUG.81- END | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL |
| 28 | LEWIS & CLARK | 0. | 0. | 125. | 31. | 348. | 33. | 0. | 0. | 8. | 2. | 0. | 0. |
| 29 | JEFFERSON | 0. | 0. | 25. | 1. | 62. | 1. | 0. | 0. | 1. | 0. | 0. | 0. |
| 30 | BROADWATER | 0. | 0. | 132. | 3. | 63. | 2. | 0. | 0. | 2. | 0. | 0. | 0. |
| 31 | CASCADE | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 32 | MEAGHER | 0. | 0. | 79. | 1. | 79. | 1. | 0. | 0. | 1. | 0. | 0. | 0. |
| 33 | JUDITH BASIN | 0. | 0. | 9. | 0. | 9. | 0. | 0. | 0. | 2. | 0. | 0. | 0. |
| 34 | WHEATLAND | 0. | 0. | 122. | 4. | 173. | 5. | 105. | 5. | 2. | 0. | 1. | 0. |
| 35 | FERGUS | 0. | 0. | 84. | 5. | 114. | 6. | 0. | 0. | 1. | 0. | 0. | 0. |
| 36 | GOLDEN VALLEY | 0. | 0. | 8. | 0. | 43. | 1. | 43. | 1. | 0. | 0. | 1. | 0. |
| 37 | PETROLEUM | 0. | 0. | 0. | 0. | 23. | 0. | 27. | 1. | 0. | 0. | 0. | 0. |
| 38 | MUSSELSHELL | 0. | 0. | 40. | 2. | 193. | 4. | 214. | 4. | 1. | 0. | 4. | 0. |
| 39 | YELLOWSTONE | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 40 | GARFIELD | 0. | 0. | 8. | 0. | 4. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 101 | ROSEBUD | 0. | 0. | 175. | 4. | 78. | 3. | 0. | 0. | 0. | 0. | 3. | 0. |
| 102 | TREASURE | 0. | 0. | 16. | 0. | 9. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 41 | MC CONE | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 103 | PRAIRIE | 0. | 0. | 0. | 0. | 23. | 1. | 18. | 0. | 0. | 0. | 0. | 0. |
| 42 | CUSTER | 0. | 0. | 191. | 11. | 169. | 11. | 118. | 9. | 0. | 0. | 7. | 1. |
| 43 | DAWSON | 0. | 0. | 16. | 2. | 176. | 8. | 106. | 6. | 0. | 0. | 3. | 0. |
| 45 | RICHLAND | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 3 | MONTANA | 0. | 0. | 1016. | 65. | 1459. | 74. | 501. | 22. | 17. | 3. | 19. | 1. |
| 106 | GOLDEN VALLEY | 0. | 0. | 13. | 1. | 39. | 1. | 21. | 1. | 0. | 0. | 0. | 0. |
| 4 | N.DAKOTA | 0. | 0. | 13. | 1. | 39. | 1. | 21. | 1. | 0. | 0. | 0. | 0. |
| 104 | WIBAUX | 0. | 0. | 44. | 2. | 53. | 2. | 12. | 1. | 0. | 0. | 0. | 0. |
| 105 | FALLON | 0. | 0. | 5. | 0. | 41. | 1. | 18. | 1. | 0. | 0. | 0. | 0. |
| 3 | MONTANA | 0. | 0. | 49. | 3. | 94. | 3. | 29. | 1. | 0. | 0. | 1. | 0. |
| 107 | BILLINGS | 0. | 0. | 16. | 0. | 8. | 0. | 3. | 0. | 0. | 0. | 0. | 0. |
| 108 | DUNN | 0. | 0. | 16. | 0. | 11. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 109 | STARK | 0. | 0. | 310. | 13. | 133. | 13. | 0. | 0. | 0. | 0. | 3. | 1. |
| 110 | MERCER | 0. | 0. | 32. | 1. | 43. | 1. | 25. | 1. | 0. | 0. | 1. | 0. |
| 111 | OLIVER | 0. | 0. | 8. | 0. | 14. | 0. | 7. | 0. | 0. | 0. | 0. | 0. |
| 112 | MORTON | 0. | 0. | 36. | 6. | 87. | 7. | 68. | 7. | 0. | 0. | 1. | 0. |
| 113 | MC LEAN | 0. | 0. | 0. | 0. | 34. | 1. | 36. | 1. | 0. | 0. | 1. | 0. |
| 114 | SHERIDAN | 0. | 0. | 0. | 0. | 11. | 0. | 11. | 0. | 0. | 0. | 0. | 0. |
| 115 | BURLEIGH | 0. | 0. | 43. | 15. | 230. | 41. | 171. | 38. | 0. | 0. | 4. | 1. |
| 116 | WELLS | 0. | 0. | 40. | 1. | 18. | 1. | 14. | 1. | 0. | 0. | 1. | 0. |
| 117 | KIDDER | 0. | 0. | 24. | 0. | 10. | 0. | 7. | 0. | 0. | 0. | 1. | 0. |
| 118 | EDDY | 0. | 0. | 20. | 0. | 16. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 119 | FOSTER | 0. | 0. | 32. | 0. | 25. | 0. | 0. | 0. | 0. | 0. | 1. | 0. |
| 120 | STUTSMAN | 0. | 0. | 127. | 7. | 99. | 7. | 0. | 0. | 0. | 0. | 3. | 0. |
| 53 | RAMSEY | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 54 | NELSON | 0. | 0. | 24. | 0. | 17. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 21 | GRIGGS | 0. | 0. | 32. | 0. | 25. | 0. | 0. | 0. | 0. | 0. | 1. | 0. |
| 122 | BARNES | 0. | 0. | 76. | 2. | 59. | 2. | 0. | 0. | 0. | 0. | 2. | 0. |
| 55 | GRAND FORKS | 0. | 0. | 0. | 0. | 65. | 10. | 61. | 11. | 0. | 0. | 1. | 1. |
| 123 | STEELE | 0. | 0. | 24. | 0. | 11. | 0. | 6. | 0. | 0. | 0. | 1. | 0. |
| 124 | TRAILL | 0. | 0. | 0. | 0. | 19. | 0. | 18. | 0. | 0. | 0. | 0. | 0. |
| 125 | CASS | 0. | 0. | 0. | 0. | 58. | 11. | 64. | 12. | 0. | 0. | 1. | 1. |
| 48 | WARD | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 4 | N.DAKOTA | 0. | 0. | 849. | 51. | 815. | 89. | 463. | 65. | 0. | 0. | 13. | 2. |
| 56 | POLK | 0. | 0. | 4. | 2. | 76. | 9. | 67. | 9. | 0. | 0. | 2. | 0. |
| 126 | NORMAN | 0. | 0. | 0. | 0. | 19. | 0. | 18. | 0. | 0. | 0. | 0. | 0. |
| 127 | CLAY | 0. | 0. | 0. | 0. | 39. | 5. | 37. | 5. | 0. | 0. | 1. | 0. |
| 57 | RED LAKE | 0. | 0. | 3. | 0. | 6. | 0. | 3. | 0. | 0. | 0. | 0. | 0. |
| 128 | MAHNOMEN | 0. | 0. | 0. | 0. | 3. | 0. | 3. | 0. | 0. | 0. | 0. | 0. |
| 58 | CLEARWATER | 0. | 0. | 7. | 1. | 28. | 1. | 18. | 1. | 0. | 0. | 0. | 0. |
| 59 | BELTRAMI | 0. | 0. | 11. | 4. | 24. | 3. | 9. | 2. | 0. | 0. | 0. | 0. |
| 5 | MINNESOTA | 0. | 0. | 25. | 7. | 197. | 17. | 156. | 17. | 0. | 0. | 4. | 1. |

## TABLE 9.4-52 TOTAL EMPLOYMENT BY CONSTRUCTION PERIOD

| COUNTY NO. | NAME | | DEC.79-MAR.80 | | APR.80-JUL.80 | | AUG.80-NOV.80 | | DEC.80-MAR.81 | | APR.81-JUL.81 | | AUG.81- END | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL | TOTAL | LOCAL |
| 28 | LEWIS & CLARK | 59. | 0. | 0. | 170. | 55. | 493. | 108. | 32. | 17. | 10. | 3. | 0. | 0. |
| 29 | JEFFERSON | 2. | 0. | 0. | 31. | 2. | 80. | 3. | 2. | 0. | 2. | 0. | 0. | 0. |
| 30 | BROADWATER | 4. | 0. | 0. | 168. | 6. | 84. | 4. | 1. | 0. | 2. | 0. | 0. | 0. |
| 31 | CASCADE | 37. | 0. | 0. | 36. | 27. | 81. | 61. | 39. | 29. | 6. | 4. | 0. | 0. |
| 32 | MEAGHER | 2. | 0. | 0. | 101. | 4. | 28. | 1. | 0. | 0. | 2. | 0. | 0. | 0. |
| 33 | JUDITH BASIN | 0. | 0. | 0. | 11. | 0. | 3. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 34 | WHEATLAND | 7. | 0. | 0. | 155. | 8. | 224. | 10. | 72. | 4. | 2. | 0. | 0. | 0. |
| 35 | FERGUS | 7. | 0. | 0. | 109. | 9. | 126. | 12. | 5. | 1. | 1. | 0. | 0. | 0. |
| 36 | GOLDEN VALLEY | 1. | 0. | 0. | 10. | 1. | 55. | 2. | 29. | 1. | 1. | 0. | 0. | 0. |
| 37 | PETROLEUM | 1. | 0. | 0. | 0. | 0. | 29. | 1. | 18. | 1. | 0. | 0. | 0. | 0. |
| 38 | MUSSELSHELL | 6. | 0. | 0. | 51. | 3. | 247. | 9. | 147. | 6. | 3. | 0. | 1. | 0. |
| 39 | YELLOWSTONE | 49. | 0. | 0. | 31. | 25. | 67. | 54. | 87. | 69. | 15. | 12. | 1. | 0. |
| 40 | GARFIELD | 0. | 0. | 0. | 10. | 0. | 3. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 101 | ROSEBUD | 7. | 0. | 0. | 233. | 11. | 123. | 9. | 4. | 0. | 0. | 0. | 1. | 0. |
| 102 | TREASURE | 0. | 0. | 0. | 20. | 1. | 6. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 41 | MC CONE | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 103 | PRAIRIE | 1. | 0. | 0. | 0. | 0. | 29. | 1. | 18. | 1. | 0. | 0. | 0. | 0. |
| 42 | CUSTER | 22. | 0. | 0. | 256. | 24. | 247. | 26. | 142. | 17. | 8. | 1. | 2. | 0. |
| 43 | DAWSON | 10. | 0. | 0. | 20. | 3. | 235. | 17. | 127. | 12. | 6. | 1. | 1. | 0. |
| 45 | RICHLAND | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 3 | MONTANA | 216. | 0. | 0. | 1382. | 164. | 2152. | 319. | 714. | 154. | 30. | 13. | 8. | 2. |
| 106 | GOLDEN VALLEY | 1. | 0. | 0. | 16. | 1. | 51. | 2. | 21. | 1. | 0. | 0. | 0. | 0. |
| 4 | N.DAKOTA | 1. | 0. | 0. | 16. | 1. | 51. | 2. | 21. | 1. | 0. | 0. | 0. | 0. |
| 104 | WIBAUX | 2. | 0. | 0. | 54. | 4. | 68. | 3. | 12. | 1. | 0. | 0. | 0. | 0. |
| 105 | FALLON | 1. | 0. | 0. | 7. | 1. | 53. | 3. | 18. | 1. | 0. | 0. | 0. | 0. |
| 3 | MONTANA | 3. | 0. | 0. | 57. | 4. | 121. | 6. | 31. | 2. | 0. | 0. | 0. | 0. |
| 107 | BILLINGS | 0. | 0. | 0. | 20. | 1. | 11. | 1. | 3. | 0. | 0. | 0. | 0. | 0. |
| 108 | DUNN | 0. | 0. | 0. | 20. | 1. | 7. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 109 | STARK | 32. | 0. | 0. | 404. | 53. | 204. | 38. | 8. | 3. | 1. | 0. | 2. | 0. |
| 110 | MERCER | 2. | 0. | 0. | 40. | 2. | 55. | 2. | 25. | 1. | 0. | 0. | 0. | 0. |
| 111 | OLIVER | 1. | 0. | 0. | 10. | 1. | 18. | 1. | 7. | 0. | 0. | 0. | 0. | 0. |
| 112 | MORTON | 13. | 0. | 0. | 48. | 10. | 119. | 16. | 76. | 12. | 4. | 1. | 1. | 0. |
| 113 | MC LEAN | 1. | 0. | 0. | 1. | 0. | 42. | 2. | 35. | 2. | 1. | 0. | 0. | 0. |
| 114 | SHERIDAN | 0. | 0. | 0. | 0. | 0. | 13. | 1. | 11. | 0. | 0. | 0. | 0. | 0. |
| 115 | BURLEIGH | 77. | 0. | 0. | 77. | 36. | 341. | 110. | 236. | 87. | 20. | 13. | 2. | 1. |
| 116 | WELLS | 1. | 0. | 0. | 50. | 2. | 24. | 1. | 14. | 1. | 0. | 0. | 0. | 0. |
| 117 | KIDDER | 1. | 0. | 0. | 30. | 1. | 13. | 1. | 7. | 0. | 0. | 0. | 0. | 0. |
| 118 | EDDY | 0. | 0. | 0. | 25. | 1. | 5. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 119 | FOSTER | 1. | 0. | 0. | 40. | 1. | 9. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 120 | STUTSMAN | 10. | 0. | 0. | 168. | 21. | 44. | 8. | 0. | 0. | 0. | 0. | 1. | 0. |
| 53 | RAMSEY | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 54 | NELSON | 0. | 0. | 0. | 30. | 1. | 6. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 21 | GRIGGS | 1. | 0. | 0. | 40. | 1. | 9. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 122 | BARNES | 3. | 0. | 0. | 100. | 7. | 26. | 3. | 0. | 0. | 0. | 0. | 1. | 0. |
| 55 | GRAND FORKS | 18. | 0. | 0. | 2. | 1. | 90. | 28. | 55. | 23. | 4. | 3. | 1. | 0. |
| 123 | STEELE | 1. | 0. | 0. | 30. | 1. | 15. | 1. | 4. | 0. | 0. | 0. | 0. | 0. |
| 124 | TRAILL | 0. | 0. | 0. | 0. | 0. | 24. | 1. | 12. | 1. | 0. | 0. | 0. | 0. |
| 125 | CASS | 25. | 0. | 0. | 15. | 11. | 108. | 40. | 61. | 27. | 4. | 3. | 1. | 0. |
| 48 | WARD | 2. | 0. | 0. | 0. | 0. | 2. | 1. | 5. | 3. | 2. | 1. | 0. | 0. |
| 4 | N.DAKOTA | 190. | 0. | 0. | 1129. | 139. | 1184. | 256. | 560. | 161. | 34. | 19. | 8. | 2. |
| 56 | POLK | 10. | 0. | 0. | 5. | 2. | 96. | 18. | 48. | 11. | 1. | 1. | 1. | 0. |
| 126 | NORMAN | 0. | 0. | 0. | 0. | 0. | 24. | 1. | 12. | 0. | 0. | 0. | 0. | 0. |
| 127 | CLAY | 7. | 0. | 0. | 0. | 0. | 49. | 11. | 28. | 9. | 1. | 1. | 0. | 0. |
| 57 | RED LAKE | 0. | 0. | 0. | 3. | 0. | 8. | 0. | 2. | 0. | 0. | 0. | 0. | 0. |
| 128 | MAHNOMEN | 0. | 0. | 0. | 0. | 0. | 4. | 0. | 2. | 0. | 0. | 0. | 0. | 0. |
| 58 | CLEARWATER | 1. | 0. | 0. | 8. | 1. | 35. | 1. | 12. | 1. | 0. | 0. | 0. | 0. |
| 59 | BELTRAMI | 3. | 0. | 0. | 14. | 5. | 32. | 6. | 8. | 2. | 0. | 0. | 0. | 0. |
| 5 | MINNESOTA | 21. | 0. | 0. | 30. | 8. | 247. | 37. | 111. | 23. | 3. | 2. | 1. | 0. |

## TABLE 9.4-53 PERSONAL INCOME

| COUNTY NO. | NAME | PERSONAL INCOME TOTAL | MAX. RATE/YR |
|---|---|---|---|
| 28 | LEWIS & CLARK | 6385.5 | 18064.3 |
| 29 | JEFFERSON | 1120.6 | 3219.2 |
| 30 | BROADWATER | 2536.9 | 5550.6 |
| 31 | CASCADE | 513.5 | 915.7 |
| 32 | MEAGHER | 1282.5 | 3079.2 |
| 33 | JUDITH BASIN | 142.5 | 342.1 |
| 34 | WHEATLAND | 4567.0 | 8117.1 |
| 35 | FERGUS | 2428.5 | 6922.4 |
| 36 | GOLDEN VALLEY | 947.4 | 2240.7 |
| 37 | PETROLEUM | 477.7 | 1197.6 |
| 38 | MUSSELSHELL | 4433.2 | 9487.1 |
| 39 | YELLOWSTONE | 639.1 | 1066.9 |
| 40 | GARFIELD | 134.0 | 314.5 |
| 101 | ROSEBUD | 3405.9 | 7494.6 |
| 102 | TREASURE | 266.0 | 629.0 |
| 41 | MC CONE | 0.0 | 0.0 |
| 103 | PRAIRIE | 402.0 | 943.5 |
| 42 | CUSTER | 6099.0 | 7768.7 |
| 43 | DAWSON | 3590.7 | 9574.5 |
| 45 | RICHLAND | 0.0 | 0.0 |
| 3 | MONTANA | 39374.0 |  |
|  |  |  |  |
| 106 | GOLDEN VALLEY | 875.8 | 1906.7 |
| 4 | N.DAKOTA | 875.8 |  |
|  |  |  |  |
| 104 | WIBAUX | 1098.0 | 2896.7 |
| 105 | FALLON | 756.0 | 2195.4 |
| 3 | MONTANA | 1854.0 |  |
|  |  |  |  |
| 107 | BILLINGS | 314.8 | 555.7 |
| 108 | DUNN | 248.1 | 555.7 |
| 109 | STARK | 5396.8 | 11633.1 |
| 110 | MERCER | 1106.7 | 1791.7 |
| 111 | OLIVER | 329.5 | 594.0 |
| 112 | MORTON | 2134.3 | 3981.6 |
| 113 | MC LEAN | 714.8 | 1745.9 |
| 114 | SHERIDAN | 186.1 | 416.7 |
| 115 | BURLEIGH | 5141.8 | 11828.3 |
| 116 | WELLS | 800.9 | 1389.1 |
| 117 | KIDDER | 455.7 | 833.4 |
| 118 | EDDY | 276.7 | 695.4 |
| 119 | FOSTER | 442.8 | 1112.6 |
| 120 | STUTSMAN | 1826.5 | 4589.0 |
| 53 | RAMSEY | 0.0 | 0.0 |
| 54 | NELSON | 331.4 | 832.9 |
| 21 | GRIGGS | 442.8 | 1112.6 |
| 122 | BARNES | 1084.9 | 2725.6 |
| 55 | GRAND FORKS | 1191.7 | 2952.4 |
| 123 | STEELE | 442.8 | 834.4 |
| 124 | TRAILL | 332.1 | 834.5 |
| 125 | CASS | 1335.6 | 3135.3 |
| 48 | WARD | 25.1 | 53.5 |
| 4 | N.DAKOTA | 24561.7 |  |
|  |  |  |  |
| 56 | POLK | 1321.5 | 3191.3 |
| 126 | NORMAN | 332.1 | 834.5 |
| 127 | CLAY | 687.6 | 1727.9 |
| 57 | RED LAKE | 101.9 | 407.1 |
| 128 | MAHNOMEN | 55.3 | 139.1 |
| 58 | CLEARWATER | 462.1 | 1238.8 |
| 59 | BELTRAMI | 391.3 | 1789.4 |
| 5 | MINNESOTA | 3351.9 |  |

## TABLE 9.4-54 PROPERTY TAXES, INITIAL AND ULTIMATE PHASE

| County and State | P/L Mileage | P/L Value | Facility Value | Initial Phase (709,000 bpd) Total Value | Assess. Ratio | Average Levy | Assessed Value | Property Tax | Ultimate Phase (933,000 bpd) Addtl. Value | Total Value | Assessed Value | Property Tax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Montana |  | 154,716 |  | 172,532 |  |  | 26,278 | 4,065 |  | 173,932 | 26,431 | 4,087 |
| Wheatland | 43 | 25,134 | 8,601 | 33,735 | 16.0 | 185.28 | 4,757 | 881 | 422 | 33,971 | 4,763 | 883 |
| Golden Valley | 23 | 11,642 |  | 11,642 | 16.0 | 160.72 | 1,863 | 299 |  | 11,699 | 1,872 | 301 |
| Musselshell | 53 | 26,828 |  | 26,82 | 16.0 | 119.62 | 4,292 | 513 |  | 26,960 | 4,314 | 516 |
| Rosebud | 80 | 40,494 | 1,833 | 43,327 | 16.0 | 91.57 | 6,636 | 608 | 427 | 42,954 | 6,704 | 614 |
| Custer | 26 | 13,161 |  | 13,161 | 16.0 | 248.15 | 2,106 | 523 |  | 13,225 | 2,116 | 525 |
| Prairie | 47 | 23,790 |  | 23,790 | 16.0 | 219.64 | 3,806 | 836 |  | 23,907 | 3,825 | 840 |
| Wibaux | 27 | 13,667 | 7,382 | 21,049 | 16.0 | 143.90 | 2,818 | 405 | 100 | 21,216 | 2,837 | 408 |
| North Dakota | (342) | 156,788 |  | 164,743 |  |  | 13,839 | 2,550 |  | 169,824 | 14,267 | 2,630 |
| Golden Valley | 21 | 9,764 |  | 9,764 | 8.4 | 142.22 | 820 | 117 |  | 9,899 | 831 | 118 |
| Billings | 19 | 8,8 |  | 8,8 | 8.4 | 111.18 | 742 | 83 |  | 8,956 | 752 | 84 |
| Stark | 48 | 22,318 |  | 22,318 | 8.4 | 194.47 | 1,875 | 36 5 | 2,157 | 24,782 | 2,802 | 405 |
| Dunn | 5 | 2,325 |  | 2,325 | 8.4 | 154.63 | 195 | 30 |  | 2,357 | 198 | 31 |
| Mercer | 18 | 8,369 |  | 8,369 | 8.4 | 177.30 | 703 | 125 |  | 8,484 | 713 | 126 |
| Oliver | 38 | 17,668 | 4,210 | 21,878 | 8.4 | 168.24 | 1,838 | 309 |  | 22,122 | 1,858 | 313 |
| Burleigh | 34 | 15,416 | 1,859 | 17,275 | 8.4 | 241.37 | 1,451 | 350 | 342 | 17,847 | 1,499 | 362 |
| McLean | 6 | 2,721 |  | 2,721 | 8.4 | 169.40 | 229 | 39 |  | 2,761 | 232 | 39 |
| Kidder | 30 | 13,603 |  | 13,603 | 8.4 | 238.63 | 1,143 | 273 |  | 13,805 | 1,160 | 277 |
| Stutsman | 13 | 5,894 |  | 5,894 | 8.4 | 183.44 | 495 | 91 |  | 5,982 | 503 | 92 |
| Foster | 33 | 14,963 |  | 14,963 | 8.4 | 170.76 | 1,257 | 215 |  | 15,186 | 1,276 | 218 |
| Griggs | 24 | 10,882 |  | 10,882 | 8.4 | 182.26 | 914 | 167 |  | 11,044 | 928 | 169 |
| Steele | 24 | 10,882 |  | 10,882 | 8.4 | 166.91 | 914 | 153 |  | 11,044 | 928 | 169 |
| Traill | 29 | 13,149 | 1,886 | 15,035 | 8.4 | 184.71 | 1,263 | 233 | 324 | 15,555 | 1,307 | 241 |
| Minnesota |  | 31,286 |  | 31,286 |  |  | 10,418 | N/A |  | 31,752 | 10,574 | N/A |
| Norman | 17 | 7,708 |  | 7,708 | 33.3 | N/A | 2,567 | N/A |  | 7,823 | 2,605 | N/A |
| Polk | 45 | 20,404 |  | 20,404 | 33.3 | 104.26 | 6,794 | 708 |  | 20,708 | 6,896 | 719 |
| Clearwater | 7 | 3,174 | 1,400 | 3,174 | 33.3 | 102.16 | 1,057 | 108 |  | 3,221 | 1,073 | 110 |

Source: Montana Department of Revenue, North Dakota Office of State Tax Commisioner, Minnesota Department of Revenue.

Note: Property taxes were calculated on January 1977, construction cost values. Major facilities including pump stations were assigned to the counties in which they were located, and pipeline values were distributed on the basis of volume-miles. Individual pump station values were estimated by distributing the total construction value among stations in accordance with station horsepower, features, and pipeline size. In Montana assessed values were calculated separately for facility value (situs property) at a common local assessment ratio of 8.55 percent, and for pipeline property at the state utility ratio of 16.0 percent.

Property tax collections computed at recent levy rates are shown in table 9.4-54. All impacted counties except the following would receive increased revenues during the operation of the pipeline: Fergus, Petroleum, Yellowstone, Garfield, Treasure, McCone, Dawson, Richland, Fallon, and Cascade in Montana; and Morton, Sheridan, Wells, Eddy, Ramsey, Nelson, Barnes, Grand Forks, Cass, and Ward in North Dakota; and Clay, Red Lake, and Mahnomen in Minnesota.

## GRAND FORKS, NORTH DAKOTA

On February 21, 1979, the North Dakota Planning Division, Bismarck, requested BLM to include an alternate route segment bypassing of Grand Forks, North Dakota and East Grand Forks, Minnesota. This alternate route was recommended by the City of Grand Forks Planning and Zoning Commission on February 7, 1979 to avoid environmental impacts upon the cities' water supply, to reduce impact upon prime agricultural lands, and to eliminate one major river crossing of the Red Lake River.

The Grand Forks alternative leaves the proposed route at pipeline mile 1,375 west of Grand Forks, North Dakota and continues directly east across the Red River about 4 miles north of the city (figure 9.4-15). In Minnesota the route turns southeast, bypassing East Grand Forks, Minnesota, rejoining the proposed route at pipeline mile 1,426. This alternative eliminates the proposed underwater crossing of the Red Lake River and crosses the Red River below Grand Forks and East Grand Forks, eliminating potential crude oil contamination of the cities' water supply. Total distance for this alternative is 54 miles compared to 51 miles for the proposed route.

This route segment would reduce construction impacts on prime farm lands and alleviate potential crude oil contamination of the Grand Forks city water supply. Although the route alternative is about three miles longer, it would cross less prime agricultural land. This would reduce impacts on agricultural production during the short term construction period.

The alternate route would cross the Red River north of Grand Forks. This would eliminate one underwater crossing for the Red Lake River, which would reduce potential construction impacts upon water quality and resident fisheries. Crossing the Red River downriver from Grand Forks eliminates the potential crude oil contamination of the Grand Forks city water supply and also alleviates the associated public concerns.

Cultivated area in North Dakota

U.S. Fish and Wildlife Service

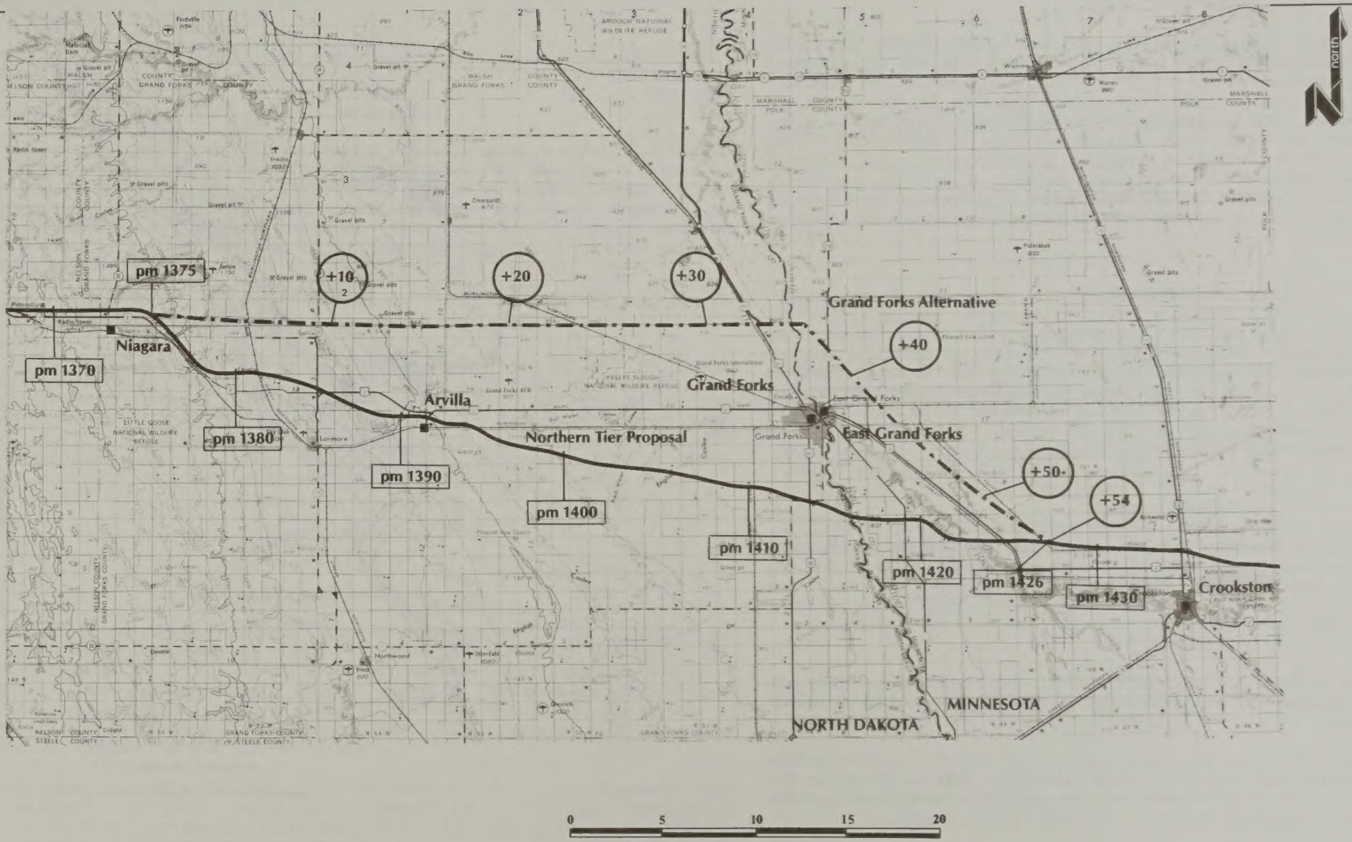


Figure 9.4-15

Northern Tier Pipeline Company

Grand Forks
Route Segment Alternative

## 9.5 Alternatives of Northwest Energy Company Proposal

### PORT AND ONSHORE FACILITIES ALTERNATIVES

#### SKAGWAY ORE WHARF

It is technically feasible to upgrade the existing ore wharf (figure 9.5-1) to receive 120,000 dead weight tonnage (dwt) tankers; however, a number of considerations make this an undesirable alternative. The berthing slip has limited maneuvering space and its use would create traffic congestion problems for other vessels which utilize the port area. The present volume of ore carrier traffic, plus the size and frequency of tanker arrivals, would increase the level of berth occupancy to over 60 percent. Even if tankers arrive on schedule, a berth occupancy in excess of 60 percent makes ship demurrage a source of concern. Moreover a large scale dredging operation would be required that would involve the removal of a substantial amount of contaminated material, lead, and zinc, and the location of a suitable site for disposal.

#### SINGLE POINT MOORING

This alternative requires a swing radius of approximately 2,000 feet. In order to provide the swing diameter which the tankers require, the mooring device would have to be placed in the center of the 6,000-foot wide channel. Channel water depth at this point averages 450 feet, which is too deep for efficient operation of the mooring device. In addition, a single point mooring cannot match the high unloading capacity of a shore-based terminal, and is more vulnerable to oil spills because long-floating and submerged flexible oil lines.

#### YAKUTANIA POINT

This alternative, differing in location from the preferred alternative, has limited feasibility. Property currently designated as a city park would be used and the extreme steepness of the harbor bottom could pose major problems in wharf construction.

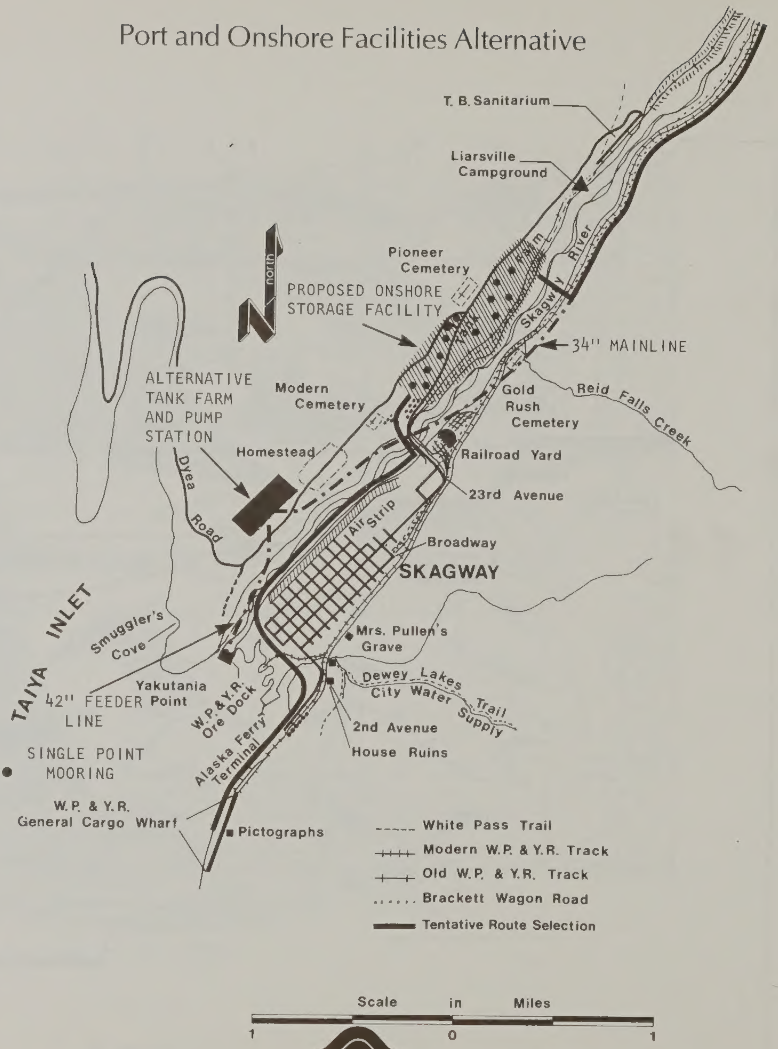
#### HAINES

Haines, Alaska is located on Portage Cove near the north end of Chilkoot Inlet. It is the point of origin for the Haines Road to the Alaska Highway and a petroleum pipeline to Haines Junction.

The city of Haines is built on a narrow, low-elevation neck on the Chilkoot Peninsula. Otherwise, its physical setting is somewhat similar to that of Skagway. The granitic and metamorphic bedrock is thinly mantled with colluvium and beach deposits of reworked colluvium. Thick alluvial deposits are probably not present.

Topography is more gentle in Haines than in Skagway, with forested lower slopes of 0 to approximately 25 degrees and as much as 30 degrees in some locations.

The Chilkoot Inlet-Chilkat River fault system passes approximately two miles west of Haines and roughly parallels the Haines Road, crossing it several times on the way to



Port and Onshore Facilities Alternative

Northwest Energy Corporation

Figure 9.5-1

Haines Junction. A magnitude 6 earthquake occurred on or near this fault approximately 15 miles northwest of Haines on March 9, 1952.

The port facility would be constructed adjacent to deep water at Haines and the oil would either be transferred to barges or pumped through an underwater pipeline and transported fifteen miles to Skagway.

Both transportation methods would involve oil spill risks not present in the primary proposal. Additional handling required by barge transport would increase the frequency of routine oil spills and the probability of a major spill. Moreover, additional tankage at Haines would probably be required.

A Haines-Skagway pipeline located on the bottom of Taiya Inlet could be subject to additional risks of underwater slides, particularly those that might be triggered by earthquake movements disturbing the steep front of the submerged portion of the Skagway River delta. The existence and extent of other smaller submerged deltas cannot be confirmed or ruled out at this time. Leak detection and repair would be considerably more difficult in the case of an underwater pipeline in a fjord of more than 600 feet depth.

### YAKUTANIA POINT ONSHORE STORAGE FACILITY ALTERNATIVE

Yakutania Point would be the only other site in the Skagway area for location of the onshore storage facility. However, the slope is relatively steep in this area and the terrain is rough. Storage tanks would have to be benched and notched into the side of the mountain. Part of the site area is within city limits and part is under the jurisdiction of the Federal government. A portion of the city-owned section is currently designated as a city park. There are also some homes built or under construction within the site area which would have to be relocated.

### ROUTE SEGMENT ALTERNATIVE

### SKAGWAY-CARCROSS HIGHWAY

A route following the Skagway-Carcross Highway was evaluated as an alternate to following the railroad right-of-way. The Skagway-Carcross Highway was opened for service in the spring of 1979. According to the Haines-Skagway Area Land Use Plan (ADNR 1979), "... the highway corridor will be managed for the dual values of transportation and scenic quality, with the emphasis on transportation. Access across or along this corridor is allowed, including pipelines...". In view of this statement, the corridor was examined as a viable alternative.

The miles of pipeline needed for this route and that needed for the proposed route along the railroad right-of-way would not be substantially different. Both would have about 14 miles of pipeline in Alaska and 5 miles in Canada up to the point where they meet. From that point the route could either follow the highway or the railroad right-of-way.

The following differences would result from use of the highway route segment:

Assuming a 90 foot wide construction corridor, this route would require an additional 55 feet of cutting into the hillside compared to 75 feet for the proposed route.

Assuming 100 percent slopes, the amount of excavated material would be 1.0 million cubic yards per mile compared to 1.2 million for the proposed route.

Requires no crossings of the Skagway River, while the proposed route would have three crossings.

Requires no removal of existing services, while the proposed route would need removal of the Canol pipeline and the utility lines presently in the railroad right-of-way.

Would not disrupt train service, whereas the proposed route would disrupt train services for one season.

Would not alter historic scene of railroad; would add to existing highway scar which is visible from the railroad.

Route passes through approximately 1 mile of Park Service land in the southwest corner of the White Pass unit.

Would disrupt highway traffic during summer tourist season while construction is occurring, whereas the proposed route would not.

Would require year-round maintenance of roadway for inspection of pipeline; this road is presently not maintained in winter, whereas the railroad is kept open year round.

Would require standard equipment for pipeline construction compared to special equipment needed for the railroad route.

Land cleared would vary from 90 - 200 acres, depending upon terrain, compared to 125 - 290 acres for the proposed route.

Would probably not affect the proposed Warm Pass Ecological Reserve.

Would not affect the historic Brackett Wagon Road.

## DELTA JUNCTION SYSTEM

The Delta Junction oil transporation system is presented as an alternative to the proposed system through Skagway, Alaska. The section includes a brief description of the proposed alternative together with the preliminary design parameters. This description is followed by a preliminary analysis of the existing environment of the Alaskan portion of the alternative route, and the analysis is in turn followed by a preliminary discussion of issues arising from a consideration of pipeline construction and operations along the designated corridor.

In this system, 500,000 barrels per day of Prudhoe Bay oil would be diverted from the 48-inch Alyeska pipeline into Northwest Energy's storage facilities at Alyeska Pump Station No. 9, Delta Junction, Alaska (figure 9.5-2). The oil would then be transported to Keg River via a new pipeline and then through existing systems to Edmonton and to ultimate markets in the U.S. This alternative system would use a 34-inch pipeline, but a smaller line (30 or 26-inch) may be preferred in the final analysis. This alternative 34-inch system would cost $1,376 million.

A Delta Junction to Keg River connection would result in 1,119 miles of new main line, with some 85 miles constructed above-ground. Because this alternative has no connection for offshore oil supplies it would be entirely dependent on Prudhoe Bay supplies of crude oil.

The oil would be received from the suction side of the Alyeska Pump Station No. 9 and delivered into the first pump station of the Alaska Highway System for transporation to Keg River and Edmonton. The continuity of service of the proposed pipeline would thus be dependent upon the ability of the Prudhoe Bay facilities to maintain supply and upon the Alyeska pipeline system to deliver that supply. A minimum of 2 days' storage should be provided at the supply source in order to minimize short-term fluctuations in the pipeline supply. This would be equivalent to 1 million barrels of storage. Thus, four 250,000 barrel storage tanks (or equivalent), complete with appropriate mixing and pumping equipment, would be required at the interconnection with the Alyeska pipeline at Alyeska's Pump Station No. 9.

No additional storage facilities would be provided at Edmonton. Thirteen pump stations would be required in total, located as follows:

| Location | Number | Horsepower - ISO 1/ |
|---|---|---|
| Alaska | 3 | 58,500 |
| Yukon | 6 | 117,000 |
| British Columbia | 4 | 78,000 |
| | | 253,500 |

1/ 50 percent standby installed

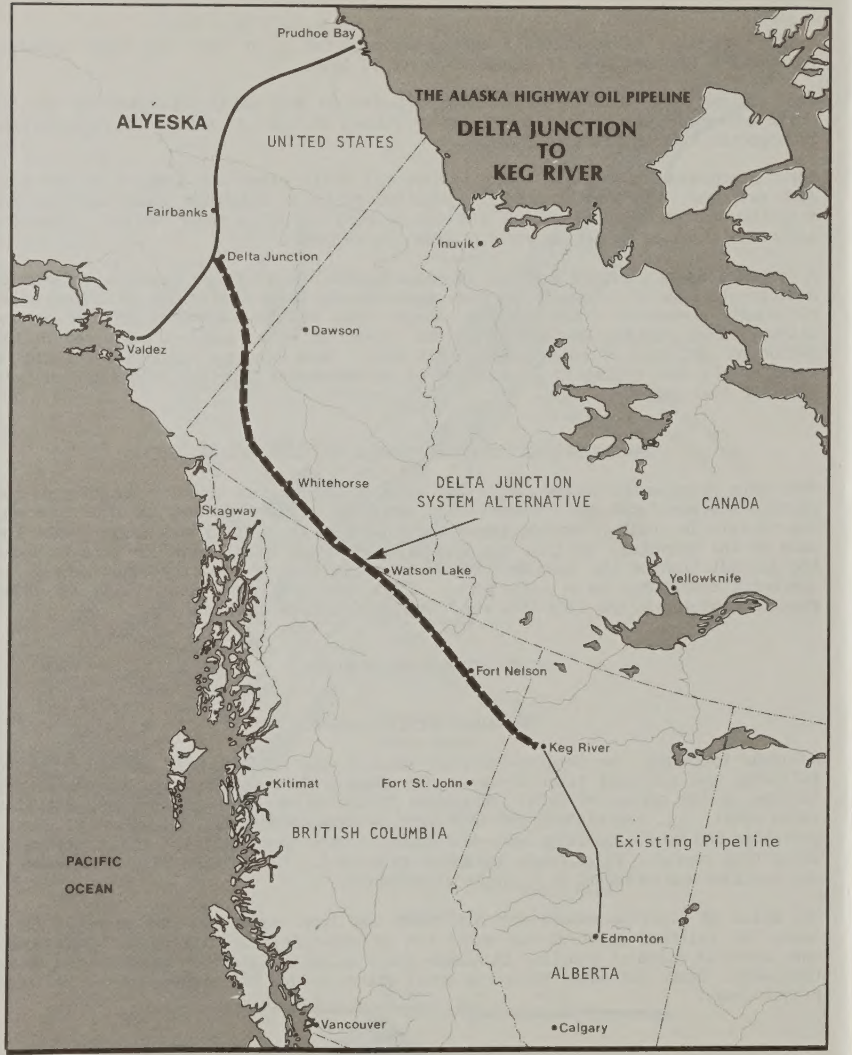


Figure 9.5-2 Delta Junction System Alternative

The starting point of this alternative oil line route would be at Pump Station No. 9 on the Alyeska pipeline, approximately 7 miles south of Delta Junction, Alaska. The route initially would head easterly for 19 miles until reaching the Alaska Highway, and then southeasterly paralleling the Alaska Highway and the approved Alaska Highway Gas Pipeline Corridor for 186.4 miles to the Alaska-Yukon border. The route would remain in the Tanana River Valley throughout this traverse of the Tanana-Kuskokwin lowlands below the east face of the Alaska Range. Six major rivers, the Gerstle, Johnson, Robertson, Tok, Tanana and Granite, would be crossed.

The route would continue in a southerly direction following the approved Alaska Highway Gas Pipeline Corridor, would cross Beaver Creek and would roughly parallel the Haines-Alaska pipeline, crossing the White River.

From the White River, the route would take a more southeasterly direction. After crossing the Koidern River at pipeline mile 236, the route generally would parallel the Alaska Highway, again crossing the Koidern River and the Donjek River downstream of the existing highway bridge.

After this crossing, the route would proceed across a plain located between the Kluane Range and the Kluane River. The settlement of Burwash Flats lies east of the route.

From Burwash Flats, the route would lie to the west of and generally parallel to the Alaska Highway, crossing the Duke River. The route would pass the settlement of Destruction Bay.

The oil line route would diverge from the gas pipeline right-of-way and follow along the east side of the Kluane Range, just west of the highway which follows the west shore of Kluane Lake.

Slims River would be crossed upstream of the existing bridge and causeway. The route would proceed around the south side of Klaune Lake and would depart from the lake and the highway. Several small creeks would be crossed in this next section. The oil line would again follow the approved route of the Alaska Highway Gas Pipeline, continuing in a more or less direct route to the southwest corner of Pine Lake.

The routing would continue from this point in an easterly direction, lying north of and generally parallel to the Alaska Highway. The village of Champagne is located approximately 2 miles from the pipeline route.

The Takhini River would be crossed and the route then would take a major diversion from the highway and would proceed through a pass to the north of Mouth Ingram. The route would be located approximately 4 miles southwest of the Whitehorse Airport. The routing would continue through the pass crossing the White Pass & Yukon Route railway at its east end, and the Yukon River. The Yukon River crossing would be approximately 1.2 miles downstream of the existing highway bridge.

The route would generally parallel the Alaska Highway and join the proposed Skagway to Keg River route.

In the following sections, a survey is made of the existing corridor proposed for the Delta Junction Alternative pipeline route through Alaska. As described earlier, this corridor is the one approved for the Alaska Highway Gas Pipeline Project, extending from Delta Junction along the Alaska Highway route to the Canadian boundary.

### Climate

The Continental zone of Interior Alaska lies south of the Central Brooks Range of mountains and inland from the coastal maritime zone. The route of the proposed alternative pipeline system lies entirely within this zone. Summer and winter temperatures are extreme and precipitation is low. Except for a few isolated locations, surface winds are light. Annual precipitation averages 10 to 14 inches. The wettest month is July, or in some cases June. Annual snowfall averages 33 to 54 inches. Snow cover continues from October through April at most locations, with the higher elevations carrying snow cover well into May and June. Average snow depth in winter is normally less than 24 inches, but maximums of 50 to 60 inches are on record for Big Delta and Northway.

Surface winds, as registered by wind recording stations near or along the pipeline route at Big Delta and Northway, are light. This description is generally representative of the sections of route near these two centers. This, however, is not necessarily true of wind direction. The terrain exerts a strong influence on wind direction by channeling through valleys, making the direction at a station applicable only to its immediate vicinity. This is demonstrated by the effect of the Tanana and Delta river valleys on directional frequencies of wind at Big Delta. Average windspeeds are also increased by the effects of channeling at Big Delta.

Mean annual "equivalent chill" temperatures are 14.9°F at Big Delta and 19.2°F at Gulkana. January is the coldest month for that portion of Alaska southward of the Brooks Range. July is the warmest month for all locations.

### Air Quality

In general terms, the portion of Alaska under consideration as a prospective oil pipeline route may be regarded as an area of naturally occurring high air quality. Even here, however, the normal contents of the atmosphere and the characteristics of its circulation are manifested in terms of their effects on visibility and on capacity for dispersion.

In those areas south of the Brooks Range with elevations below 1,000 feet, ceiling and visibility of three miles or better occur 93 percent of the time. At locations like Fairbanks, for example, wintertime fog is a factor. At the higher elevations of

Big Delta and Northway, winter fog is considerably less frequent due to more winds, low level mixing of the air, and fewer sources of condensation nuclei for the formation of fog.

Some of the areas traversed by the proposed pipeline route are protected from the prevailing winds by ranges of mountains. These "orographic" effects together with such phenomena as thermal inversions, barometric highs and lows, and "Chinook" type winds all occur in varing degrees along the route. Such occurrences result in ice fogs, or "white-outs", bizarre wind storms and extremely low temperatures in the Alaskan interior.

For an atmospheric pollutant to increase its concentation in a given location, vertical mixing of the air must be stopped by a temperature inversion and, given the condition, the situation will be aggravated by a lack of horizontal mixing and/or by the presence of surrounding high ground. Some of the valleys south of the Brooks Range and along the proposed pipeline route represent areas which, when affected by temperature inversions and/or conditions of calm, may trap and retain atmospheric pollutants.

In spite of the generally good atmospheric quality over this area of Alaska, localized sources of atmospheric pollutants do exist. These are for the most part, connected with human settlements and involve vehicles, both residential and commercial heating facilities, and power generation facilities.

In addition to noxious pollutants produced by internal combustion engines, water vapor is produced, which in turn leads to the formation of ice fog. The occurrence of ice fog can often be related to organic fuel combustion which provides both moisture and nuclei for its formation.

## Noise

No data covering noise are known to be available for the parts of Alaska that would be crossed by the proposed oil pipeline system. It is generally conceded, however, that objectionable noises are rare.

## Topography and Geology

A portion of the proposed pipeline route lies within the physiographic unit known as the Yukon-Tanana Uplands. A belt of highly deformed Paleozoic sedimentary and volcanic rocks containing conspicuous limestone units, overthrust and overturned to the north, extends along the north side of the upland. The rest of the upland is chiefly Precambrian schist and gneiss but has scattered small elliptical granitic intrusions in the northwestern part; large, irregular batholiths make up much of the southeastern part. In the western part a thick mantle of windborne silt lies on the lower slopes of the hills, and thick accumulations of "muck" (a mixture of frozen organic matter and silt) overlie deep stream gravels in the valleys.

The proposed pipeline route would enter the Yukon-Tanana Uplands south of Hess Creek and leaves it at Shaw Creek Flats. The route is underlain by reworked windblown silt, colluvial silt, sand and rock fragments, alluvial silt, sand, gravel and dune sand. Locally, the unconsolidated deposits are absent or occur as a thin veneer over bedrock which consists chiefly of schist dolomite, limestone, granite and volcanic rocks.

In the Tanana-Kuskokwin Lowlands, the outwash varies from coarse gravel near the Alaska Range to sand and silt along the axial streams. Areas north of the axial streams are underlain by thick deposits of muck. Parts of the southwestern portion of the lowland have thick loess cover, but the central and eastern parts are free of loess south of the Tanana River. Scattered low hills of granite, ultramafic rocks and Precambrian schist rise above the outwash. Tertiary conglomerate in the foothills of the Alaska Range plunges beneath the lowland in a monocline, and the heads of the outwash fans may rest on a pediment cut across the conglomerate. The base of alluvial fill in the Fairbanks area lies at or below sea level.

The succeeding portion of the proposed pipeline route begins at Shaw Creek and ends at the Canadian border. Geological units to be traversed include frozen ice-rich silts over alluvial gravels from Shaw Creek across the Shaw Creek Flats, frozen silt (loess) over bedrock (schist) from the southern end of Shaw Creek Flats to the Tanana River, and generally thawed gravels and sands of alluvial origin in the Tanana River Valley to the boundary.

The Tanana Valley is underlain primarily by unconsolidated sediments probably several hundred feet thick; the maximum recorded thickness is 200 feet adjacent to the Canadian border. The most extensive unconsolidated materials are broad alluvial fans of sand and gravel. Overlying parts of these fans are moraines composed of coarse to fine-grained soils. Finer-grained deposits, primarily poorly-drained silt high in in content of organic material peat, occur adjacent to the floodplain, and in the lowlands southeast of Tetlin Junction. These materials are generally soft and wet during the summer but firmly frozen during the winter. Larger but discontinuous deposits of sand and gravel are available from the river bars, which are inundated during the spring. Most of the surficial materials are covered by loess.

Alaska lies along the northern edge of a vast, continuous, seismically active belt that circumscribes the Pacific Ocean basin and parallels the Alaska and Coast Ranges and the Aleutian Islands. In spite of this, however, the proposed pipeline route southeast of Delta Junction traverses a region of relatively low seismicity. The closest recorded large earthquakes have occured approximately 100 miles norhtwest of Delta Junction near Fairbanks. A few epicenters of earthquakes measuring 2 on the Richter scale were reported near the corridor southeast of Delta Junction.

A local fault extends some 25 miles from Clearwater Lake, in the Big Delta quadrangle, southeastwards to the Gerstle River in the Mt. Hayes quadrangele. It consists of a series of parallel to sub-parallel, north-facing escarpments, with minor right slip and a normal-slip component of the south side up. The fault would be crossed by the pipeline route south of the Tanana River.

Southeast of Big Delta, there is no known surface evidence of active faults crossing the Tanana Valley. There is, however, some evidence of two linear zones of seismicity that may be related to subsurface faults.

### Soils

Soil is continuous over the Alaskan land surface except for the steep, rugged mountain peaks and areas of perpetual ice and snow. Topography and drainage influence soil development by affecting soil moisture temperature and stability. Sheer, mountainous areas preclude soil development. The rapid drainage of knolls, ridges and steep slopes depresses plant growth; hence soils are shallow and low in organic matter. On the more gently sloping lands, soils retain moisture and plant growth is better. Poorly-drained lowlands may receive so much surface water that muskeg and swamp areas form. Permafrost impedes internal drainage of the soil profile and thus arctic soils are considered immature. Tundra and bog soils are common and widespread.

The Yukon-Tanana Upland is characterized by broad, undulating divides and flat-topped spurs; the ridges have crest altitudes of 1500 to 3000 feet and rise 500 to 1500 feet above adjacent valley floors. The ridges and valley sides have a mantle of colluvial and wind-blown (loess) silts. The major valleys are floored with alluvial sands and gravels which commonly have a thick covering of organic silts. On the steep hill slopes and ridge crests, the colluvium is shallow, generally less than 4 feet thick. The major soil types are: loose-to-dense colluvium with windblown silts; wet organic silts predominatly in low-lying areas; and dense sand and gravel alluvium (e.g., floodplains of the Salcha River and in the vicinity of Ross Creek).

The Tanana-Kuskokwin Lowland comprises a broad depression bordering the Alaska Range on the north. Wet loams with thick overlying peat and permafrost occupy lowland areas along rivers. Other poorly-drained soils occupy lower slopes adjacent to valley bottoms in the Tanana Valley. Their texture becomes more gravelly at higher elevations. Well-drained brown, loamy soils overlying gravelly-to-sandy materials occupy terraces, outwash plains, and low hills in the Tanana Valley near the Kantishna and Nenana Rivers, and occur in association with sandy soils of dune areas along the Kantishna. These brown loams also form in the upper valley from the Delta River to Tok in association with wet soils of lower slopes.

A layer of volcanic ash, 2 to 6 inches thick, is found in profiles of the Northway Junction area, material deposited approximately 14,000 years ago by an eruption within either the Wrangell or St. Elias Mountains.

Along the proposed pipeline route, moderately deep and well-drained brown upland soils are most extensive. Gravelly-to-sandy brown soils occupy moderate to steep slopes along the upper Tanana Valley from Big Delta to the boundary, and are shallow to moderately deep over gravelly parent material and bedrock.

Stratified sandy alluvial soils occupy river terraces along the Tanana River in the Birch Lake areas. Wet, loamy soils with a thick over-lying peat layer occupy low areas along drainages, extending to low gravelly slopes of the uplands along the upper Tanana. The major soil types are: moderately-dense to dense silts over dense sand, locally overlain by thin (5 feet) organic-rich silt; loose, wet, organic-rich silt to a 10-foot depth, over sand and gravel; dense alluvial sand and gravel (e.g., floodplains and terraces of the Tanana and Delta Rivers).

Many of the soils traversed by the proposed pipeline route are characterized by "permafrost". Local variations in thickness, areal extent, and soil temperature depend on differing thermal properties of earth materials and on local differences in climate, topography, vegetation, geology, hydrology, glacial history and rate of heat flow within the earth. In many places such local variations mask the regional southward decrease in areal extent and thickness and southward increase in permafrost temperatures.

In the Yukon-Tanana Upland, south of Fairbanks, much of the surface soils material is thawed; however, there are large accumulations of ice in some of the sediments, especially the fine-grained, reworked silt.

With respect to the route through the Tanana-Kuskokwin Lowland, permafrost is generally continuous from Shaw Creek to the Tanana River, and discontinuous in the Tanana River Valley. The permafrost table is highly variable, ranging from 2 to 20 feet, but locally depressed as much as 40 feet near the Chena River. The active layer varies from 0 to 2 feet, but extends to as much as 6 feet in sand and gravel. Segregated ice is rare and when present (in silts) is in the form of crystals, coatings, seams and sometimes wedges. Little or no visible ice is present in sand or gravel.

The predominately coarse-grained deposits of the Tanana Valley, which are the most extensive, are generally underlain by numerous isolated masses of permafrost more than 25 feet below the surface, and extending to recorded depths of 90 to 209 feet. Scattered lenses of permafrost, in the hills composed of loess and sand, are 2.5 to 3.5 feet below the surface. In the finer-grained deposits containing silt, organic soils and peat, the permafrost is usually 1 to 3 feet below the surface, except in the immediate vicinity of streams or ponds.

### Aquatic Resources

#### Hydrology and Water Quality

The pipeline would cross a portion of one of the major hydrologic regions of Alaska, the Yukon region, and for the major part of that traverse lies within the Tanana subregion. Most water storage is provided by the winter snowpack. While the proposed route does not lie near the termini of any glaciers, there are active glaciers at the headwaters of rivers tributary to the Tanana. These glaciers store tremendous amounts of water and many of the streams draining into the Tanana are glacier-fed.

Mean annual runnoff ranges from one cubic foot per second (cfs) per square mile in the Tanana subregion lowland to four cfs per square mile in the Alaska Range. Mean annual peak runoff ranges from about 10 cfs per square mile in the lowlands to 50 cfs per square mile in the Alaska Range and the uplands of the Upper Yukon-Tanana boundary. Most annual peaks occur in summer from rainfall, although spring snowmelt can also cause annual peaks. Low flow is usually in late winter or early spring, following the winter streamflow recession. Mean annual low monthly runoff ranges from between 0.2 cfs per square mile in the Tanana subregion lowlands to 0.3 cfs per square mile in the Alaska Range. Streams in many small basins probably freeze completely during most winters. During winter, when there is little or no snowmelt or rain, the large contribution to streamflow is groundwater discharge in the channels of the larger rivers.

In the Upper Yukon region, all surface water sampled has been of the calcium bicarbonate type of acceptable quality. A few of the streams carry excessive iron content during part of the year.

Surface water sampled in the Tanana is of acceptable quality for public supply. Although concentrations of dissolved solids range from 60 to 484 milligrams per litre (mg/l), most samples are less than 200 mg/l. The dissolved solids content is highest in water from areas adjacent to the mountains and decreases in water from areas toward the center of the basin. Water sampled near the center of the basin has the highest concentration of dissolved solids during periods of low flow, when groundwater discharge is probably greatest. The streams flowing from the Alaska Range are generally higher in sulphate and magnesium content than the others, but none contain excessive amounts.

Suspended sediment concentration in Alaskan streams has been recorded for less than 5 years, which is not highly reliable for predictive purposes. In general, nonglacial streams transport less than 100 mg/l of suspended sediment during May through October, in contrast to as much as 2,000 mg/l for glacial streams. Nonglacial streams often transport their highest concentrations during spring melt from May through June, with other peaks occurring in August through September. Glacial streams transport their highest concentration during heavy glacial melt, usually in middle or late summer, but also carry high concentrations during spring snowmelt. During fall and winter, glacial and nonglacial streams both carry less sediment than in summer.

For nonglacial streams draining into the Tanana River, normal summer concentration of suspended sediments range from 10 to 300 mg/l. Normal summer concentration in the Tanana River range from 10 mg/l in the headwater to more than 1,000 mg/l downstream. Concentrations during the winter are generally less than 20 mg/l for all streams measured in this basin. The average annual sediment yield of the basin ranges from less than 100 tons per square mile in the mountains north of the Tanana River to perhaps 5,000 tons per square mile in the Alaska Range.

Glacial-outburst flooding is a potential occurrence in the Tanana subregion. Glacier-dammed lakes are waterbodies at least partially contained by glacier ice. The lakes usually form when a depression either on or adjacent to a glacier, a pocket beneath it, or a valley blocked by a glacier is filled by rain and runoff from melting snow and ice. At some critical point, the water erodes a channel through or beneath the ice and the lake drains rapidly. The resulting floods have sharp, sudden peaks. Glacier-dammed lakes form initially, may break out and never refill, or the filling and draining cycle may be repeated many times.

Recent unfrozen alluvial deposits in river valleys, including floodplains, terraces, and alluvial fans, are the principal groundwater aquifers along the proposed pipeline route. Aluvium, consisting largely of permeable sand and gravel, ranges in thickness from a few feet in small mountain valleys to 2,000 feet in the Tanana Valley. Glacial and glaciolacustrine deposits in the interior valley are a much smaller source of groundwater near the proposed pipeline, but the older consolidated bedrock is capable of small yields from fractures and is used locally for water supply in the Yukon/Tanana uplands. Groundwater also occurs in cavernous carbonate rocks that support large springs near the pipeline route.

Recharge of principal alluvial groundwater reservoirs along the proposed pipeline route occurs largely through the unfrozen zones underlying streams. The most important source of groundwater recharge in the Tanana Basin is seepage from streams. Seepage losses from streamflow in Jarvis Creek near Big Delta average 10 cfs per linear mile of channel.

Discharge of groundwater from principal alluvial aquifers along the proposed route occurs largely as base flow discharge to streams. Groundwater is also discharged at springs, lakes and wetlands and directly by evapotranspiration from shallow groundwater reservoirs.

In the Yukon hydrologic region, the alluvial deposits of the Tanana subregion have the highest potential for groundwater yields in Alaska, exceeding 1,000 gallons per minute (gpm) in the floodplains. Upland deposits yield less than 100 gpm.

Surface icing occurs throughout the proposed pipeline corridor. Masses of ice may be formed by the overflow and subsequent freezing of sheets of emerging groundwater and springs. No one factor alone, but a complex interaction of several factors control the incidence of icing. At any given site, topographic, geologic, hydrologic, and meteorologic factors determine the dynamics, regime and magnitude of the icing process. Icings form on streams when channel ice thickens and restricts flow; hydrostatic pressure increases so that water breaks out, spreads and freezes, causing icings to thicken throughout the winter as successive ice sheets accumulate. Thick floodplain icings commonly form on the shallow channel of braided rivers. Icings also form along shallow channels where winter streamflow is sustained by groundwater. Large springs are the source of major icings in some river valleys. Small springs and seeps of groundwater form small upland or hillside icings.

## Fisheries

Surveys indicate that the fishes of the Tanana River watershed apparently overwinter in the clear river waters flowing beneath the thick surface ice. As early as mid-April adult grayling move upstream into the thawing streams. They are followed by immature grayling and perhaps some whitefish. The grayling spawn as soon as the streams are ice-free and the water temperatures rise, in May or June. The adults leave the small tributaries immediately after spawning, remaining in the more silt-free downstream waters. The fry remain in the small tributaries until late August or September. A general downstream movement occurs in fall, as glacial melting is retarded and silt load in the rivers is reduced.

Round whitefish and humpback whitefish behave similarly, but their upstream movement occurs later. The downstream movement apparently is sychronized with that of the grayling.

Northern pike and turbot also ascend the streams in spring, but their movement is not as extensive and many fish remain in the tributaries near the river or in adjacent sloughs.

The life history of Dolly Varden of the small tributaries in this area is not well understood. Since this species is a fall and winter spawner, its downstream migration may occur under ice in winter. It is believed that completely frozen streams may sometimes force Dolly Varden, perhaps accompanied by grayling and whitefish, to overwinter in perennial springs.

Little is known of the other less abundant species in the Tanana River above Delta Junction. The chum salmon that spawn in the area are few and most are seen in late August and September. Both historical and more recent observations, though admittedly limited, have suggested that a few salmon spawn throughout the upper Tanana River, but there are no major concentrations.

## Terrestrial Vegetation

The proposed pipeline corridor would traverse five broad vegetation types within the Tanana river valley. Plants of this region are subject to some of the greatest climatic extremes in North America. The principal trees characterizing the transcontinental boreal forest reach their northern limits in this region. Interactions of severe climate, repeated fires, discontinuous permafrost and braided drainage systems have produced a complex vegetational pattern.

The Bottomland Spruce/Poplar Forest is primarily composed of white spruce locally mixed with balsam poplar. The best white spruce stands are on level floodplains and low river terraces. Balsam poplar represents a successional stage leading to a mature forest with ferns, grasses, lichens, herbs and mosses. The forest type is confined to level, broad floodplains, low river terraces, and the more deeply-thawed south-facing slopes of major rivers. The above type is found extensively along the Tanana River and is somewhat less extensive along its major tributaries.

The Upland Spruce/Hardwood Forest is a fairly dense forest of white spruce, paper birch, quaking aspen, and balsam poplar. Black spruce usually replaces white spruce on north-facing slopes and poorly drained flats. White spruce occur in mixed stands on south-facing slopes and well-drained soils and may form pure stands near streams. Paper birch and quaking aspen stands, usually an early stage of succession following fire, tend to be even-aged and more uniform in size than spruce stands. Aspen and birch predominate on well-drained southern slopes. Under growth in this type normally consists of mosses and grasses on drier sites and brush on moist slopes.

This is the most extensive vegetation type in the Yukon Region. Treeline extends from 2,000 to 3,500 feet along the Alaska/Yukon boundary to 2,000 feet on southern slopes of the central Brooks range. White spruce becomes scattered among high brush as treeline is approached.

The Lowland Spruce/Hardwood Forest of evergreen and deciduous trees is dominated by black spruce which sometimes forms extensive pure stands. It is a slow-growing species, but can invade burns rapidly. Slow-growing stunted tamarack are associated with black spruce in wet lowlands. Rolling basins and knolls in the lowlands support various mixtures of white spruce, black spruce, paper birch, quaking aspen and balsam poplar. Bogs and muskegs occur on lower ground. Undergrowth may include willow, dwarf birch, various shrubs, grasses, ferns, horsetail, lichens and sometimes a thick cover of mosses.

This forest type occurs extensively on shallow peat, glacial deposits and outwash plains in intermontane basins and on lowlands and north-facing slopes thoughout the Yukon Region. It occurs at elevations ranging from sea level to 1,500 feet in higher basins and lowlands to more than 2,500 feet on north-facing slopes.

Extensive bogs occur on poorly drained soils where conditions are too wet for tree growth. Bog vegetation may consist of sedges, mosses, shrubs and berry bushes, resin birch, dwarf birch and willow. Some low-lying saturate soils support conttongrass tussocks surrounded by shrubs. Widely-spaced and stunted spruce and tamarack may occur on higher ground. Bog surfaces in the region often have uneven, string-like ridges (string bogs), usually too wet to support shrubs.

Muskegs occur primarily in unglaciated areas, old river terraces, outwash plains, filling ponds and sloughs and occasionally on gentle, north-facing slopes.

Moist tundra consists of a varying mixture of cottongrass tussocks and dwarf shrubs. Associated species are grasses, sedges, mosses, horsetail, low-growing willows, dwarf birch, and a few berry bushes. This type occurs sporadically in the foothills of the Brooks Range with some representation in elevated areas of the upper Tanana drainage.

Alpine Tundra occurs on ridges and rocky slopes where bedrock is close to the surface. The soil is usually coarse and shallow and contains little humus. Alpine tundra is most common at elevations between 2,000 to 4,000 feet. Vegetation is usually sparse and seldom more than a few inches high. White-mountain areas and lichens usually dominate, along with low-growing herbs, grasses, sedges, and both resin and dwarf birch.

### Threatened and Endangered Species

No plants which have been proposed for federal status as threatened or endangered species are known to occur within the Tanana river valley.

### Ecological Reserves

Of the 233 units proposed as reserves throughout Alaska, two are located in the Tanana River Valley where pipeline construction and operation may affect them.

The Healy Lake and River system located approximately 30 miles east of Delta Junction is one of the proposed units, and Robertson River, located approximately 20 miles northwest of Tanacross, is the other. Detailed descriptions of the reserves are being prepared but are unavailable at present. There has also been no discussion of boundaries of these units in the literature. Boundaries will probably be set after there has been a decision on which units to include in the system.

The Healy Lake and River is under private ownership and has undergone minor development, with cabins located around the lake shore. If included in the reserve system it will remain in private ownership, with no change in plans for development or otherwise.

The Roberston River is presently under state ownership and has had no previous development, except where the Alaska Highway crosses it about 1 mile east of its junction with the Tanana River. No change in ownership or development policies is anticipated should the river be included in the reserve system.

## Terrestrial Wildlife

Highly productive of wildlife are the basins of the Yukon and Tanana rivers. The Minto Flats and Tetlin Lake vicinities are centers of high production for water-oriented animals and birds. Interspersed scrubby timber, brush, marsh and muskeg throughout these interior valleys also support upland species.

Less productive are the surrounding highlands. Many are covered with unbroken spruce forests and support few animals. Red squirrel and pine marten, which can meet all their habitat needs in this single type, are exceptions.

Some species, like the wolf, wolverine, and raven, thrive in a broad range of conditions at any season, and may be found almost anywhere in the region that provides adequate food. Others, such as the moose and many passerine birds during migration, are confined to one habitat type for nesting or winter feeding, but they utilize a broad range of habitats at other seasons. Other species, as for example the red squirrel, ruby-crowned kinglet, and the beaver, are adapted only to a narrow range of habitats.

The broad valleys of the Tanana River drainage covered with mixed spruce/hardwood and mukeg/bog vegetation, in combination with river islands and bars covered with young willows, provide an intermixture of habitat types favorable to numerous woodland mammals. Most species found in wooded habitats occur in reasonable abundance, although the numbers of certain species in particular areas may vary in response to habitat changes such as fire or to hunting pressure.

Caribou use a variety of habitats, but the best winter range is in sparse upland spruce timber where snow cover is not excessively wind-packed and where forage is available. Some wind-blown alpine slopes also provide good forage. Other suitable winter range may consist mainly of sedges.

Several caribou herds range within the general area. The fortymile herd is in the White Mountains and Tanana Hills. The smaller Delta, Chisana, Mentasta and McKinley herds also range within the southern portions of the Tanana river drainage.

The grizzly bear of the Yukon Region, smaller than its coastal counterpart, tends to favor open slopes and mountainous areas. Black bears occur generally throughout forested valleys, preferring open mixed forests but also appearing on alpine tundra in their search for roots and berries. Dall sheep occur in the mountains of the Alaska Range to the south and east of the Tanana valley. Sheep occupy much of the alpine tundra in summer, but are restricted in winter to slopes blown clear of snow. Gray wolves and wolverines range throughout various habitats and may occur anywhere from the main river channels to high mountain ridges in either winter or summer, wherever their prey is available. Wood bison usually summer on the dry grass meadows on bars of the lower Delta and Gerstle rivers. Winter range includes pastures that do not become wind-packed; the animals move to windswept alpine meadows east of the Delta River in late winter and spring.

Much of the Yukon Region provides excellent habitat for diverse and abundant populations of terrestrial birds. Millions of migratory birds transit the North American continent and north Pacific Ocean in spring to breed and nest on lands drained by the Yukon River and its tributaries. About 28 species of resident birds remain in the region throughout the year.

The upper Yukon river basin is best known for the highly productive bird habitats in the streams, lakes, marshes and varied woodlands of the Yukon Flats. Twenty species of raptors birds occur in the Yukon basin and of these 18 breed there.

Bald eagles nest in small numbers along the river lowlands of the Yukon physiographic region, while a few golden eagles nest on ledges and other areas associated with alpine tundra. Ospreys, goshawks, red-tailed hawks and great horned owls are considerably more abundant than other large raptors and are widely distributed throughout forested habitats. The gyrfalcon is known to occur in the southern highlands of the area and may nest there.

The peregrine falcon is of particular importance because of its status as an endangered species and its relative abundance along the Yukon river. It may also nest on tributaries of the upper Yukon. Peregrines are diminishing in numbers; their lack of reproductive success appears due to the concentration of pesticide residues in their tissues. High pesticide levels have been found in Artic peregrine falcons within the eastern Yukon drainage and there is grave concern for the future of this population. Peregrine falcons nest on bluff faces too steep to support continuous vegetation or to provide access to the nest site by predators. A nest site may be utilized repeatedly, though it is common for a pair to utilize several sites over a period of years. Though the birds are very sensitive to human intrusion into the nesting area, traffic on major rivers does not seem to disrupt nesting activity.

Thirty-one species of shorebird, including plovers, sandpipers and phalaropes have been recorded along river or lake shorelines in this area. Recent work has shown that a migratory movement of 175,000 to 200,000 lesser sandhill cranes passes through the area of the upper Tanana river valley every spring and fall, making this one of the most significant avian migration patterns of the region.

More than 70 species of passerine birds utilize the habitats of the Yukon river region. Of these, at least four species appear to be restricted to the Tanana river drainage.

Despite long, cold winters, about 28 species of birds remain as winter residents. Included are two species of hawks, three of grouse, two of ptarmigan, four woodpecker species and about a dozen passerine species.

## Cultural Resources

This section deals with the archaeological and historical resources along the proposed routing of the Delta Junction oil pipeline alternative. The corridor extends along the Alaska Highway beginning at Delta Junction, terminating at the Alaska/Yukon border.

### Archaeological

Two of Alaska's most important archaeological sites, Healey Lake and Dixthada, are located near the proposed route between Delta Junction and the Alaska/Yukon border. Healey Lake, eligible for the National Register, contains the earliest radiocarbon-dated archaeological material uncovered in Alaska. The Dixthada site contains a long, almost continuous sequence connecting prehistoric and historic Athabascan culture of subsistence hunting.

Recent investigations are beginning to clarify the chronology and affiliation of early sites in the interior. The evidence from Healey Lake and artifacts discovered in association with non-extinct Pleistocene fauna along tributaries of the Tanana suggest that the area may be one of the most likely for discovery of Paleoindian sites. The lower part of the corridor crosses one the most favorable areas for continuous human occupation, which provides an ideal situation for information on developmental sequences. The orientation of historic and immediate prehistoric tribal units to major river arteries suggests that archaeological sites within the impacted corridor could reveal valuable information for ethno-archaeological studies which would expand our understanding of earlier economic and social systems.

A 1978 archaeological survey of the Alaska Natural Gas pipeline alignment from Delta Junction to the Yukon Border provided a 100 percent intensive walk-over coverage of all designated survey segments along the right-of-way. For the purposes of this survey, the criteria used to designate a site were: 1) a site exhibits definable limits; 2) it contains evidence of more than a single occurrence of human activity; and 3) if no other criteria exist for defining a site, then artifact density must be greater than five artifacts per square meter.

The walk-over survey found no sites within areas investigated. However, there are areas near the alignment where the configuration of topographic and other features suggests a camp location. Most of the human use of the area was found to consist of modern trails, traps and debris from building the Alaska Highway and the Haines and Canol pipelines.

### Historical

No historical sites are listed for this portion of the proposed pipeline route. However, the route would traverse the Forty Mile gold field region bordering Alaska and the Yukon and would parallel the Alaska Highway, built during the early years of World War II.

## Visual Resources

The proposed pipeline would lie in a transportation corridor which includes the Alaska Highway and the proposed Alaska Highway gas pipeline and the 8-inch Haines-Fairbanks pipeline.

## Land Use

In the region from the Yukon river south and east to the Canadian border, land uses are commonly the kinds associated with modern communities, transportation, and operation of federal facilities. Intermixed are subsistence and recreational uses of wild lands, some agriculture, and the commercial use of land along the highway system.

### Native Lands

There are four native villages, all lying within the responsibility of the Doyon Corporation and the Tanana Chiefs Conference, in the vicinity of the pipeline corridor. These are Dot Lake 1976 population - 63; Tanacross, 1976 population - 125, Tetlin, 1976 population - 112; and Northway, 1976 population - 215. The percentage of native residents of these four villages who continue to pursue subsistence activities only is about 3.5 percent. About 25 percent depend exclusively on wage employment, 27 percent on public assistance programs and the remaining 45 percent on both subsistence activities and wage employment.

### Wilderness Areas

All of the proposed oil pipeline route follows an established transporation corridor. No existing national parks, wildlife refuges, or wild and scenic river areas would be involved. Approximately 10 miles of the route near the Canadian border would be within the proposed Wrangell Mountains National Forest. No areas of potential wilderness would be involved.

### Agriculture and Forestry

Two small extensions of upland soil near Delta and Tanacross provide 70,000 acres of land suitable for cultivation. Some stands of white spruce and birch have commercial potential. There is a sawmill at Delta Junction and a small operation between Delta and Tok Junctions.

## Transporation and Utility Networks

The proposed Delta Junction to Keg River, Alberta oil pipeline would parallel the Alaska highway in Alaska. This corridor includes the 6-inch diameter Haines to Fairbanks military pipeline and three associated pump stations and would include the approved Alaska Highway Gas Pipeline and its operations and maintenance facilities.

### Airstrips

There are three federally owned, five state-owned, and five private airstrips between Delta Junction the Alaska-Yukon border.

### Highways

The Glenn highway from Anchorage terminates at the Alaska highway at Tok and the Richardson Highway joins the Alaska Highway at Delta Junction.

## Recreation Resources

Along the Alaska Highway from Delta Junction to the Alaska-Yukon border recreation activities such as hunting, fishing, boating, hiking, sightseeing, and cross-country skiing are extensive. There are seven state waysides for camping in this area: Gardiner Creek Campground, Deadman Lake Campground, Lakeview State Campground, Tok River State Wayside, Moon Lake Campground, Big Gerstle River State Wayside, and Clearwater State Campground. There are also about eight road-side picnic sites.

## Social and Economic Conditions

### Regional

The proposed project and all communities within 10 miles are included in the Southwest Fairbanks Census Division, which follows the Alaska Highway from west of Delta Junction to the Canadian border. The only settlement within the division whose population would be subject to direct or indirect impact from the project is Fort Greeley, a U.S. Army base. The division had a 1970 Census population of 4,189, of which nearly half were at Fort Greeley.

The population characteristics of the impact region (i.e., the Division excluding Fort Greeley) are summarized in table 9.5-1. The population is 20.7 percent Alaskan Native. Most of the Alaskan Native population lives in small villages and rural areas. The population of Delta Junction is mainly non-Alaskan Native. The sex ratio shows a slight preponderance of males. Most of the Delta Junction population is working age. There is a larger proportion of children and old people in the balance of the region.

The most recent population estimate for the Division by the Alaska Department of Labor was 4,893 in July, 1977. Average monthly wage and salary employment in the Division was 819 in 1977. The major industries of the region, excluding Fort Greeley, are trade services based on Alaska highway trade and local consumption demand. Other significant industries are state and federal government (state troopers, schools, FAA), seasonal construction, and transportation.

There are other important sources of "basic" income to the region, including income earned elsewhere on seasonal or occasional work such as major construction projects, transfer payments (native claims payment, disability, AFDC), subsidized services (health, schools), and in-kind value of the subsistence harvest.

Settlements

Settlements located on or within 10 miles of the pipeline route, pump stations, and storage facility as listed in table 9.5-2 are the ones most likely to experience direct or indirect population impacts. Further data on the larger settlements (25 or more) is given in table 9.5-3.

The four major native villages in the area are Northway, Tanacross, Tetlin and Dot Lake. A demographic survey of these villages was conducted in August, 1976 by University of Alaska researchers.

- 515 persons live in the villages, of whom 465 are native;
- 90.3 percent of the total village populations are Interior Alaskan Athabascan Indians;
- there is a potential workforce of 302 persons;
- 208 individuals have at least one job skill or area of work experience;
- 66 individuals or more have received formal vocational training; the training emphasis for males is construction-related, and for females is in clerical/office work;
- almost all native inhabitants are dependent to some extent on subsistence activities; only 24.8 percent are primarily dependent upon wage employment.

Community inventories show minimal capacity in the Alaska Native villages for serving the demands and service needs of a major non-native population influx. There are a cafe, bar, a state trooper station, and two general stores at Northway; a lodge (no bar, some groceries) at Dot Lake; clinics at Northway and Tanacross. There are no community water or sewer systems. It was noted that Northway is in fact two villages an FAA complex, mainly white, and 5 miles away a much larger village, mainly native.

TABLE 9.5-1 POPULATION CHARACTERISTICS OF DELTA JUNCTION SYSTEM

| | Delta Junction City | Rest of Division | Region Total 1/ |
|---|---|---|---|
| Total Population | 703 | 1,676 | 2,379 |
| White Male | 350 | 646 | 996 |
| White Female | 312 | 534 | 846 |
| Indian Male | 3 | 233 | 236 |
| Indian Female | 1 | 241 | 242 |
| Aleut Male | 0 | 2 | 2 |
| Aleut Female | 0 | 2 | 2 |
| Eskimo Male | 2 | 5 | 7 |
| Eskimo Female | 1 | 3 | 4 |
| Other Male | 17 | 4 | 21 |
| Other Female | 17 | 6 | 23 |
| Percent Native | 1.0 | 29.0 | 20.7 |
| Sex Ratio 2/ | 112.4 | 113.2 | 113.0 |
| Person 15 years and younger | 213 | 623 | 836 |
| Percentage | 30.3 | 37.6 | 35.4 |
| Persons 60 years and older | 9 | 116 | 125 |
| Percentage | 1.3 | 7.0 | 5.2 |
| Persons between 15 and 60 | 481 | 917 | 1,398 |
| Percentage | 68.4 | 55.4 | 59.2 |
| Demographic Dependency Ratio 3/ | 46.2 | 80.6 | 68.7 |

Sources: ISEGR, 1972a, 1972b, from 1970 Census Tapes

1/ Southern and Fairbanks Census Division, excluding Fort Greeley.

2/ $\frac{\text{Males}}{\text{Females}} \times 100$

3/ $\frac{\text{Persons under 15 and over 60}}{\text{Persons between 15 and 60}} \times 100$

TABLE 9.5-2 SETTLEMENTS ALONG DELTA JUNCTION ROUTE 1/

| Name | Estimated current Population 2/ 3/ | Miles from Alaska Highway |
|---|---|---|
| Big Delta | * | 0 |
| Delta Junction | 730 | 0 |
| Clearwater Ranch | * | 6 |
| George Lake Lodge | * | 0 |
| Dot Lake | 63 | 0 |
| Cathedral Rapids | * | 0 |
| Mansfield Village | * | 6 |
| Tanacross | 97 | 1 |
| Tok | 274 | 0 |
| Tetlin Junction | * | 0 |
| Nabesna Village | * | 5 |
| Northway | 192 | 5 |
| Charlieskin Village | * | 5 |
| Northway Junction | * | 0 |
| Gardiner Creek Camp | * | 0 |
| Seaton Road House | * | 0 |
| Border City Trading Post | * | 0 |

1/ Alaska Map E, U.S. Geological Survey 1973. Order is west to east.

2/ U.S. Department of Interior, Alaska Natural Gas Transportation System. Final environmental impact statement. Washington, D.C., March 1976 p. 720.

3/ Places with less than 25 persons not separately enumerated.

* Data unavailable.

TABLE 9.5-3 COMMUNITIES, POPULATION AND NATIVE ENROLLMENT ALONG THE DELTA JUNCTION ALTERNATIVE

| Community | 1970 Census Native | 1970 Census Non-Native | 1970 Census Total | ANCSA Enrollment 1973 1/ | Total Current Population Estimate |
|---|---|---|---|---|---|
| Delta Junction | 10 | 693 | 703 | 2/ | 730 |
| Dot Lake | 29 | 13 | 42 | unknown | 63 |
| Northway | 10 1/ | 30 1/ | 40 1/ | 203 | 192 |
| Tanacross | 77 | 7 | 84 | 150 | 97 |
| Tetlin | 108 | 6 | 114 | 113 | 107 |
| Tok | 26 | 188 | 214 | 12 | 274 |

Source Alcan Pipeline Company 1976; U.S. Department of Interior 1976

1/ Native must enroll in a particular village, not necessarily current place of residence, to receive benefits under the Alaska Native Claims Settlement Act.

2/ Not an authorized native village for ANCSA purposes.

Community inventories show minimal capacity in the Alaska Native villages for serving the demands and service needs of a major non-native population influx. There are a cafe, bar, a state trooper station, and two general stores at Northway; a lodge (no bar, some groceries) at Dot Lake; clinics at Northway and Tanacross. There are no community water or sewer systems. It was noted that Northway is in fact two villages: an FAA complex, mainly white, and 5 miles away a much larger village, mainly native.

The other major settlements of non-native population are at Delta Junction and Tok. Community inventories are not presently available. Delta Junction, classified as a second-class city, and incorporated in 1960, is the only incorporated city in the region.

In this section, the environmental, social and economic elements described in the existing environment are analyzed for impacts of the Delta Junction system in both its preconstruction and construction and its operations and maintenance phases. Due to the conceptual nature of project design, no attempt is made to discuss ultimate abandonment of the system.

## Corridor Impacts

From Delta Junction to the Canadian border, the proposed alternative oil pipeline route would lie in parallel with that of the approved gas pipeline route and also in close association with the Alaska highway. At the present conceptual level of design, the term "corridor" can only be defined as a variable band of land, usually bounded by physiographic features, which would contain the highway and the two prospective pipelines within close proximity. Given that location constraints on various modes of transportation may vary, the alignments of the pipelines and the highway may diverge considerably in certain areas.

Disturbances during all phases would be confined to the corridor and would be incremental on those already existing there, i.e., there would be no new disturbance of wilderness or natural areas. The same logic would apply to water crossings where, for example, only one limited reach of a stream would be affected by the three transportation elements. All phases would also benefit from the easy access granted by the highway and the consequent reduction of disturbance from road-building activities. Surveillance, patrol, monitoring and response to contingencies would all be facilitated.

One of the few negative aspects of a corridor approach is the potential burden which could be placed upon the capacity of the atmosphere to disperse localized pollutants. This effect could be largely mitigated by locating pump stations some distance from compressor stations and by ensuring that neither are placed close to human settlements.

## Climate, Air Quality and Noise

### Construction Phase

No significant effects are perceived on macro- or microclimate during preconstruction and construction.

The impacts on existing air quality during these phases would generally be temporary. During the summer season, dust would be the primary particulate matter added to the air environment. Dust particle concentrations would tend to be greatest during the light-wind, somewhat inversion-prone night hours. These phases in winter would generate no significant amounts of dust but combustion products could develop higher concentrations than in summer. Construction camps or activity centers would briefly cause local concentrations of combustion by-products.

The equipment used in pipeline construction would increase noise levels. Additional temporary noise would be generated by explosives. Effects on wildlife would be temporary, and any adverse impacts could be minimized by proper construction scheduling.

### Operation Phase

No significant effects are expected to climate during operations.

In this phase, dust would be a minor concern. With respect to combustion products, winter time light winds and stronger, more persistent temperature inversions, coupled with topographic effects could bring about localized buildup of pollutants in the vicinity of pump stations. In winter, under calm conditions with ambient temperatures below -25°F, resulting in strong low-level inversions, ice-fogs may form in the vicinity of pump stations and may cause short delays in transportation in certain locales. These meteorological entities would be limited in a real extent and are of transient nature. Operations of the pipeline which might comprise potential ice-fog areas would be resolved on a site-specific basis.

## Topography and Geology

### Construction Phase

Within Alaska the pipeline route would require clearing, cutting and filling of up to 2,030 acres of terrain underlain by windblown silt, colluvium, alluvium, dune sand and exposed bedrock such as schist, limestone, and granite.

Large quantities of aggregate would be required as bedding for the pipeline in buried portions of the route.

In locations where the route would traverse steep slopes substantial cuts would be excavated, increasing the likelihood of downslope movement.

Geological Hazards. Within Alaska, Yukon Territory, and northwestern British Columbia the route would lie within seismic zone 3. Although major damage to structures can be expected due to earthquakes of Ritcher magnitude greater than 6 such an event is considered unlikely during the construction period.

### Operation Phase

Impacts to the pipeline, pump stations, and associated facilities would be expected from major earthquakes and downslope movements. In places where the route crosses thick deposits of alluvial, colluvial, or aeolian material, particularly where water-saturated, ground shaking, differential settlement, liquefaction, or slump could damage or rupture the pipeline during a severe earthquake. On steep slopes, rockslides, rockfall, slump, or landslides may also damage facilities; in some cases the likelihood of downslope movements may be increased by excavation.

## Aquatic Resources

### Construction Phase

Construction would introduce added sediment into waterbodies. No permanent alteration of stream hydraulics or impediments to fish migration would occur.

There would be localized utilization of supplies of water for hydrostatic testing and, during discharge of the testing liquids, some alteration in the temperature regime and in the channel morphology of the receiving streams.

### Operation Phase

There is a remote possibility of pipeline rupture and oil spill into aquatic systems. The extent would be limited by block and check valves and leak detectors.

## Terrestrial Vegetation

### Construction Phase

The following impact discussion was adopted from the Federal Power Commission's FEIS on the Alaska Natural Gas Transportation Systems (Vol. II issued April 1976 and supplement issued September 1976), and the USDI, Bureau of Land Management's FEIS issued March 1976.

Vegetation would be cleared from the proposed route, access roads, work camp areas, compressor station sites, graded slopes, and gravel pits. The direct impact of clearing would be minor compared to total vegetation throughout Alaska. Local and indirect impacts on vegetation and animal species would occur as a result of clearing and would be more critical.

Removal of the insulating plant cover and exposure of bare soil along the pipeline route would induce local changes in the microclimate and initiate a series of impacts on the soil leading to soil instability and erosion.

In permafrost areas, clearing of vegetation and compression of the organic mat by construction equipment would allow increases in soil temperatures and increase the depth of thaw along the proposed route during the summer, causing some degradation of the upper layers of permafrost, perhaps triggering a host of phenomena such as subsidence and slumping. Such soil instability would encourage erosion and weaken the support of existing vegetation. Conversely, the increased depth of thaw and increased soil temperatures would encourage root growth, change the amount and distribution of soil moisture, and slightly lengthen the growing season. This would aid revegetation, although the species that would benefit most from permafrost degradation might not be the species originally occupying the proposed route.

Lower soil moisture in the pipeline berm, and increased micro-relief, would create another set of conditions alien to the present plant communities and would probably result in at least two new sets of communities growing along the crest side slope of the pipeline mound. These changes in plant species occurrence and communities would radically modify the landscape through which the pipe passes and make its location easily visible to the knowledgeable observer.

Soil compression, permafrost degradation, berm left atop the pipeline trench, trenching, erosion control measures, grading, and gravel pad construction could alter existing drainage patterns on the surface or beneath the soil. Compression would hinder moisture penetration and decrease the moisture retention of the soil. Berms would tend to create moist spots uphill from the trench while making areas downhill drier. Berms would also intercept drifts of windblown snow and create slower-thawing spots in the spring. Subsurface drainages might be intercepted by the pipeline trench and channeled away from their original directions of flow. Erosion control measures required where the vegetation would be cleared would create new runoff patterns. Grading would alter slopes and reduce topographic irregularities, altering runoff and moisture penetration. Gravel pads would block surface drainages and compress underlying soils to some extent. Culverts installed in gravel pads would redirect surface flows.

Whatever the mechanism behind a change in drainage pattern, some change in the distribution and type of vegetation along the right-of-way would result. Where water is impounded, vegetation will be drowned and eventually the present plant communities will be replaced by pond, marsh, and wetland vegetation.

Vegetation downslope which is deprived of its normal water supply would be replaced gradually as plant species better adapted to drier sites became established. The downslope changes may be slower than the upslope changes, but the ultimate results would be the same--i.e., replacement of the present natural vegetation by a new mosaic of communities.

Some merchantable quality forest would be cut in crossing the bottomland and spruce-hardwood and upland spruce-hardwood type. A closed forest canopy does not exist and timber stands of merchantable quality and quantity are widely scattered. The amount of timber to be removed within the immediate impact zone would be insignificant. This timber, although economically marginal, should be salvaged where possible. Since only a small timber area would be affected and possibly salvaged, the impact on commercial forest is considered insignificant. Local stands would have value to nearby users and could be salvaged for local use.

Along most of the proposed pipeline route, the topsoil on which vegetation depends is relatively thin. The excavation of the pipeline trench would expose less fertile subsoils. If care is not taken to assure that the topsoil is replaced atop the berm when the trench is filled, the trenched area would lose fertility and probably would not revegetate as quickly, nor with the same species, as the rest of the right-of-way.

Wherever land is cleared, adjacent vegetation would be exposed to the wind and would be more susceptible to wind damage.

Vegetation killed or weakened by construction activities and numerous indirect impacts would provide breeding grounds for insects and disease organisms, particularly if the vegetation cleared from the route were not quickly and properly disposed of. The spruce bark beetle, for instance, could breed in dead vegetation, then attack living white spruce trees. Vegetation injured during the construction process or weakened by exposure of its roots, loss of soil moisture, or contact with toxic chemicals would be more susceptible to invasion by insects, fungi and plant diseases. Vegetation already infected would suffer greater impact from parasites because of construction-related stresses.

As noted in the discussion on permafrost degradation, clearing of vegetation would expose more of the ground surface to sunlight. Besides increasing the soil temperature, this exposure would affect vegetation adjacent to the cleared areas and influence revegetation. Shade-intolerant species near the clearings would proliferate, while species requiring shade would be eliminated, at least temporarily.

Surface vehicle travel during the winter causes much less disturbance of the tundra soils and vegetation than at other times of the year. But even in the winter, varying amounts of damage will occur. The extent of damage will depend on the depth of snow cover, microrelief of the site, vegetation type involved, amount of soil moisture, and depth of organic layer.

Secondary impacts resulting from construction and operation of the pipeline would affect an additional but undetermined area through changes in the plants' environment. These secondary impacts, which modify habitats, would result in greater long-term changes in plant communities and the functioning of tundra and boreal forest ecosystems than the seemingly more severe short-term construction impacts.

### Operation Phase

Following construction, the entire right-of-way would likely be reseeded with exotic grass and herb species. Evidence to date indicates that certain exotic varieties of grasses can be expected to germinate and grow more successfully than the native grasses tested, at least during the first 2 or 3 years. The native grasses will gradually dominate the site as the percentage of plant cover increases, but plant succession proceeds very slowly in the Arctic and it could be 50 years or more before the vegetation on the pipeline mound resembles that in the adjacent undisturbed communities.

Of the 90-foot right-of-way needed for construction, 75 feet would be retained as a permanent right-of-way. During the life of the proposed project some means of shrub control would be needed. The removal of shrubs would prevent normal succession and maintain the vegetation at a lower successional stage. Manual maintenance clearing would produce impacts similar to but less extensive than those produced during the original clearing. Maintenance vehicle movements would add to soil compression along the route. Herbicides might also be employed in some areas along the right-of-way to control vegetation. Used indiscriminately, herbicides could be carried off the right-of-way by wind and water to impact vegetation some distance from the area of intended control.

Emergencies would require pipeline repairs during the summer when the ground is not completely frozen. It is during the period when the root zone is thawed that all plant communities are most susceptible to disturbance, and repair and maintenance activities at that time have the greatest potential for adverse impacts on tundra vegetation.

Low shrub-heath vegetation is less severely damaged by summer vehicle traffic but, as with other vegetation types, the degree of disturbance depends on vehicle weight (and ground pressure), track design, soil moisture, proximity of frost to ground surface, and the number of vehicle passes across the surface.

The potential of pipeline or equipment failure must also be considered a potential threat to increasing the risk of forest fires.

Most toxic spills associated with the operation of the proposed pipeline would probably occur in the vicinity of the compressor stations and in other areas where supplies and equipment were stored. Maintenance and repair activities along the route might also lead to spills. Oil spills due to a slow leak or a major break could significantly impact the environment.

### Abandonment Phase

Abandonment of the pipeline will likely mean filling it with an inert material and leaving it in place. Under these conditions, no further impacts to vegetation would occur.

Impacts associated with revegetation will remain until such time that native species have reestablished on the site.

### Ecological Reserves

Two proposed reserve units could be impacted by the construction and operation of a pipeline system throught the Tanana river valley.

The Healy Lake and River which is located 30 miles east of Delta Junction is approximately 10 miles from the proposed pieline corridor at its closest point. It is unlikely that any activities of the pipeline construction would impact the reserve. However, operation of the pipeline entails the risk of oil spills, and should one occur at the Johnson River crossing, the oil would enter the Tanana River and flow toward the Healy Lake area. Depending on the size of the spill, how soon it is detected, and how quick clean-up operations began, impact to the reserve unit could be severe. For a discussion of oil spill impacts on aquatic systems see chapter 3.

The Robertson River is located 20 miles northwest of Tanacross, and would be crossed by the pipeline. A bridge exists across the river for the Alaska Highway, and could carry the pipeline; however, no such proposal has been mentioned. Whether the pipeline is carried by the bridge, buried under the river, or crosses the river above ground at a location other than at the bridge, impacts to the river would occur during construction. The severity of these impacts would depend on the type of river crossing. The potential for impacts also exists during the operation phase due to the risk of oil spills. An oil spill at the Robertson River crossing would potentially affect 2 miles of the system downriver from the crossing. Most of the impact would be felt in this area, but the effects would also show up in Tanana River.

## Terrestrial Wildlife

### Construction Phase

For the most part, construction of a warm-oil pipeline along a route wherein a certain degree of industrial activity has already occurred would be a continuation of existing stresses or an increment to them. Movements of people, trucks, heavy equipment, aircraft and similar activities would already have had their effect, animals intolerant of such disturbance may have already moved away or otherwise adapted. Disturbances such as blasting could disrupt nesting of birds and animal migrations, but such damage could be reduced by careful scheduling.

Raptors nesting on bluffs over the Tanana River and concentrations of nesting birds near lakes east of Northway would be of major concern with respect to blasting activities. Such activities should not have significant effects on mammals. General construction activities and noise could disturb peregrine falcons and Dall Sheep during nesting and lambing periods.

### Operation Phase

Pump station noise could deny some species the use of certain areas of habitat. Again, raptor nesting habitat along the Tanana River heights would be an area of concern. There is some latitude for adjustment of the locations of pump stations along the pipeline route, which would give scope for avoidance of critical habitat.

The above-ground section of pipeline could form a barrier to caribou from the Fortymile, Mentasta, Chisana and Delta herds. Small numbers of bison might also be affected.

## Cultural Resources

### Construction Phase

The impact associated with the proposed construction could be both direct and indirect. Direct impact would result from actual pipeline construction activities such as digging for gravel and riprap, landclearing, ditching and levelling of land by blasting, ripping, and blading. Where such activities do encounter sites these would be either partially of totally destroyed. Indirect impact would occur if workers collected artifacts for souvenirs or where soil erosion, soil creep, and other secondary disturbances affected physical and chemical integrity of the sites.

A 1978 surface survey of the proposed alignment found no evidence of "sites," therefore such impacts are unlikely along the pipeline corridor.

While no prehistoric or early historic period sites are present within the proposed alignment, there are areas nearby where the configuration of topographic and other features suggests a camp location. Access routes could have an adverse impact on these.

The 1978 surface survey found no indication of sites along the proposed right-of-way; however, there is potential information to be derived from the distribution of isolated artifact clusters which were considered as "non-sites." Such phenomena are to be recorded and located on maps whenever encountered in further studies.

As with archaeological sites, the impact of pipeline construction on historical properties would relate directly to location of construction activities and mitigative measures adopted. Construction activity and/or the siting of compressor stations or maintenance yards could permanently alter the environment around historical sites.

However, no historical sites have been identified to date along the proposed right-of-way.

### Operation Phase

There would not likely be any impact on cultural, archaeological, or other unique features during the operations and maintenance of the pipeline.

Immediate indirect or secondary impact would come from souvenir collecting and/or vandalism, which could remove scattered trail side artifacts or archaeological value.

## Visual Resources

### Construction Phase

Clearing of a pipeline right-of-way requires removal of existing vegetation and exposure of the soil which results in an immediate visual impact. Where a swath must be made through forested areas revegetation will result in a moderate color and texture contrast. Where the pipeline is designed to be above ground the installation of pipe supports would affect the aesthetic quality of the local environment. Since the route of the proposed alternative would lie in an existing transportation corridor where significant visual impacts have already occurred, the contrasts would be minimized.

### Operation Phase

The above ground pipeline would affect the aesthetic quality of the corridor as would the visibility of the pump stations located in the corridor and the storage facility at Delta Junction. The development of new borrow pits could also contribute to reduction in scenic qualities along the highway. Much of the granular material required would be taken from existing pits thus minimizing the opening of new pits and reducing the possibilities for further aesthetic degradation.

## Land Use

### Construction Phase

The major possible impacts upon existing land uses during the construction phase would relate to the physical condition of the Alaska Highway and road system; the usual uses of that road system (for commercial and recreation purposes); airports and airfields; grave material sites; and the general utilization of lands for recreational and subsistence hunting, fishing and trapping purposes. Such impacts must be assessed in light of the fact that construction would be along a route where industrial activity has already occurred. These impacts would be continuation of existing stresses or an increment to them. Movements of people, trucks, heavy equipment and aircraft, would already have had an effect, and wildlife, intolerant of such disturbances may already have moved away or otherwise adapted.

Although appropriate measures would be taken to reduce adverse effects, some localized and short-term noise and dust disturbance to residences and communities could be anticipated, where project construction or movements of manpower and materials occur in close proximity to local populations. The impact upon agriculture or forest products would be negligible.

Gravel would be required and the need for borrow pits would result in short-term impacts to the environment. In some cases revegetation after construction could be used to prevent potential long-term impacts. Some gravel sites would have to be left open.

Both short and relatively long-range impacts would be expected upon subsistence and recreational activities involving fish and wildlife resources along the proposed route.

Disposal of waste materials consisting of spoils, vegetation (including trees), construction materials, camp wastes and hydrostatic test water would impact upon various land uses.

Operation Phase

Upon completion of construction, impacts on the physical conditions of the Alaska Highway and road system, existing recreational and commercial uses of the system, airports, water supplies, material sites and utilization of wildlife should, for the most part, be eliminated. High volume heavy traffic should no longer be a problem nor should competition with existing uses. There should no longer be a load on any port facilities, railroads or airports that would be used to transport construction materials.

Certain material sites would be required for operation and maintenance of access roads, pump stations, airstrips and other appurtenances of the line. At these sites, revegetation and rehabilitation would be delayed as long as materials were needed.

Utilization of lands would be reduced when large numbers of construction personnel are no longer required.

The demands on water supplies would be to meet the need of small crews at pump stations, with the exception of water requirements for hydrostatic testing in the event of pipe failure and repair.

Both requirements would be significantly less than those for construction camps and hydrostatic testing during construction.

Solid wastes would accumulate during operation in much smaller quantities than during construction. Disposal of wastes requires care in site selection to avoid thermal degradation of soil or contamination of ground water supplies. Proper storage and frequent disposal of all wastes, usually by incineration, would avoid the continuing problems associated with scavenging animals.

## Transporation and Utility Networks

Construction Phase

The material supply transportation system to support construction of the Delta Junction alternative would utilize existing facilities and infrastructure. Materials for the construction of the Alaska segment would be delivered through the ports of Anchorage and Valdez and moved to the existing right-of-way via existing surface transportation networks (the Alaska Railway and Alaska State Highways, Numbers 1, 3 and 4) which connect the port facilities with the Alaska Highway, located adjacent to the pipeline right-of-way. Materials for the Yukon segment would be brought into the ports at Haines and Skagway and moved via the Haines and Skagway-Carcross Highways and the White Pass and Yukon Route railway. A relatively minimal amount of land preparation would be required at Skagway and Haines for storage. Although the existing infrastructure and supply networks are considered capable of accommodating the projected traffic volumes, the increased traffic levels, caused by workers, construction activity, and shipping of project pipe and supplies, would create some impacts. Congestion could occur in the vicinity of Delta Junction and Tok and to a lesser extent at the customs station at the border.

An area of major highway impact would be that segment of the Alaska Highway from the Tanana River east of Tok to the Canadian border. This section of road was built with marginal materials and designed for low-volume traffic.

During Alyeska's pipeline construction, the many airstrips along the route were generally able to absorb the impact. The airports along the Alaska highway could be expected to handle this project's demands as well.

Operation Phase

During the operation phase, transporation impacts should be minimal.

## Recreation

Construction Phase

Increases in traffic and uses of campgrounds along the Alaska Highway during construction could overtax the capacity of the existing campgrounds in the pipeline corridor.

Experience on other projects of a similar nature in the western provinces of Canada and with the Alyeska project indicates that a percentage of the work force would be visited by relatives while at the worksite. The low cost of campgrounds and close proximity to work areas would likely attract a number of visitors during the summer months. The number of campground users would be augmented by other project induced in-migrants who arrive with camper units. With no expansion of existing facilities any additional demands for campground space would result in campsites reaching capacity early in the season and with shortages perhaps occurring during peak periods in July and August. Congestion at campgrounds could create some inconvenience for tourists and recreationists. If congestion occurs in campgrounds it could lead to increased camping in unserviced areas, which could create problems such as improper garbage disposal.

The construction of the pipeline near campgrounds may cut off access for short periods of time. Campers in campground sites near construction activities could experience noise and dust associated with the large work force and the movement and operation of heavy machinery.

Operation Phase

During operation the pump stations would be located far enough from campgrounds to preclude disruption of campground activities.

## Social and Economic Conditions

Employment

Direct employment on the project would be of local and Alaskan residents as much as possible, but a large number of non-local and out-of-state workers would still be required. Local consumption and expenditures of non-local project workers during construction would be minimized by company policies of siting and servicing the construction camps away from existing villages but could still leave a significant temporary impact. Trade, service, and government employment growth could be expected throughout the region, especially affecting the settlements already having significant highway-oriented commercial facilites (Tok, Delta Junction, Border City). Major Alaskan cities, especially Fairbanks, would also get some trade. Operating employees would be free to locate in existing communities and would contribute to longer-term growth. Abandonment of the project would cause some local unemployment.

Incomes

Experience of other remote pipeline projects suggests that over half the construction wages would be sent out of the region, but a large part of the operating wages would be spent there. Both the construction and operation phase payrolls would be significant in the economy of the region.

Population

The total population influx is estimated to include 15 dependents for every 100 construction jobs, and 130 dependents for every 100 induced or operating job. A number of speculative job seekers could be expected for short periods because of easy highway access. The total influx to construction camps and existing settlements could be considerably larger than the present population of that region. At the beginning of operation, the population would drop, but existing settlements would grow as they absorbed operation workers, their dependents, and other persons induced to move into the project area.

Housing

Existing settlements have negligible permanent housing capacity relative to the size of the expected influx. Approximately 150 housing units would be needed by the operating and induced work force and dependents. In addition, the provision of serviced camper space would discourage the formation of squatter camps with associated water pollution, fire and health hazards.

Community Services

New community or household water and waste systems would be needed. Major expansions of other services would be required commensurate with the population impacts.

The Delta Junction local government would bear short-term expansion costs but be rewarded with a large increase in its property tax base.

The cost of state services would rise commensurately with permanent population, but should be more than compensated with increased income taxes and royalty netbacks.

## CANADIAN ROUTE ANALYSIS

The following analysis concerns the alternate pipeline route which continues on from the Alaska-Yukon border. The Canadian portion described here extends from the Alaska-Yukon border near Beaver Creek to Squanga Lake, Yukon.

As would be the case in Alaska, the pipeline route in Canada would closely parallel the Alaska Highway gas pipeline route which in turn follows the Alaska Highway corridor from the Alaska-Yukon border to the vicinity of Squanga Lake. The oil pipeline would thus be located within an existing transporation corridor already occupied by the Alaska Highway, the Alaska Highway Gas Pipeline, the Haines-Fairbanks products pipeline (from border to Haines Junction), several communities (e.g., Beaver Creek, Burwash Landing, Haines Junction, Whitehorse) and associated infrastructure. Prominent natural features along the route include the Pickhandle Lakes complex, the Kluane Range of mountains and Kluane Lake, the Ibex Pass-Mount Ingram area near Whitehorse, the Yukon River, Marsh Lake and Squanga Lake.

### Terrestrial Vegetation

A pipeline project necessitates clearing of land for the pipeline right-of-way and for permanent and temporary facilities. Vegetation would be removed from these areas and thus the impact is localized. On areas disturbed by the pipeline project revegetation would follow. At certain permanent facilities such as pumping stations, vegetation would be eliminated over the long term. In summary, impacts on vegetation would be localized, but unavoidable. Rare or unique communities or complexes would be protected as much as practical.

### Terrestrial Wildlife

The project would result in some level of short-term disturbance to terrestrial wildlife and in localized loss of habitat. Both mammals and birds would be affected.

### Hydrology and Water Quality

During the preconstruction-construction phase of a pipeline project, potential impacts on hydrologic resources would usually arise from activities such as negotiating water crossings and withdrawing water for project purposes, or by drainage interruption and from pollution sources such as camp wastes and fuels, lubricants and chemicals.

During operation, the above applies to a much lesser extent; however, in the case of an oil pipeline, greater concern relates to a potential pipe failure, resulting in the release of oil into the environment. The ultimate concern is for water quality in the context of domestic and recreational use, aesthetics, and aquatic habitat for fish and wildlife.

Serious impacts on hydrologic resources are not anticipated. Sources of potential hydrologic impact would be addressed in depth during detailed project planning. Particular emphasis would be given to appropriate design (e.g., block and check valves, and leak detection system) and location of the pipeline to limit potential impact of any pipe failure and to contingency planning for response to pipe failure.

Fishery

Over 25 species of fish inhabit the major drainage systems crossed by the pipeline route, but not all these are found in the immediate vicinity of the route. Included among the species found along the route are chinook and chum salmon, arctic grayling, and several species of whitefish. Potential impact on fish resources relates primarily to habitat alteration, particularly through siltation, and secondarily through introduction of other harmful substances, water withdrawal or level change, and physical disruption of important sites (e.g., spawning beds).

Land Use

A pipeline project necessitates a commitment of land for project facilities, thereby excluding other possible uses of the land. This principle is compatible with the concept of a multiple use corridor. Current land use patterns along the Alaska Highway corridor from the Alaska-Yukon border to Squanga Lake result in a scattered patchwork of land committed to human use. "Developed lands" are primarily associated with the highway, highway facilities (campgrounds, service stations, etc.) and townsites. Other committed lands include Kluane National Park, the boundary of which parallels the Alaska Highway. Some of the lands in the corridor are also used for less concentrated activity such as recreation, trapping, hunting and fishing.

Implications of the Canadian Corridor

The Canadian segment of the Delta Junction alternative pipeline route runs from the Alaska/Yukon boundary near Beaver Creek to Keg River, Alberta. This is a distance of 934 miles, of which 727 miles (or approximately 78 percent) lies within a "transportation corridor." This corridor would contain three elements, the Alaska Highway, the approved gas pipeline, and the prospective oil line.

## 9.6 Alternatives of Kitimat Pipe Line Ltd. Proposal

### ALTERNATIVE PORTS AND ROUTES

Four alternative ports and routes to move crude oil via pipeline from the West Coast of British Columbia to Edmonton were identified for consideration in the preliminary stages of the project. The Bella Coola alternative, the Ridley Island alternative and the Port Simpson alternative were all rejected due to adverse marine conditions (Kitimat Pipe Line, Ltd. 1976).

The fourth alternative, the Kitimat alternative, was selected as the most feasible and practical port-pipeline system. Investigations of environmental and socio-economic feasibility were focused on this proposed port and route.

Following Kitimat's submission to the Canadian National Energy Board, supplemental information was requested (Kitimat Pipeline, Ltd. April 1977). The Canadian NEB submitted the following to Kitimat Pipe Line, Ltd.:

> The submission describes a number of alternate port sites on the northern coast of British Columbia and gives some reasons why they were considered less suitable than Kitimat. Since the objective of the project overall is to provide a transportation terminus for oil bound for the north central United States, it is not obvious that the northern coast of British Columbia is the only possible port location. In addition, a detailed comparative base must be developed and described to clearly show the relative values of alternative sites. Included in such a study must be evaluation of alternative sites. Included in such a study must be evaluation of alternative approach routes which are in fact simply an extension of the sites themselves.
>
> For all alternative port sites, provide order of magnitude cost estimates, including system capital costs and throughput costs per barrel, as a comparision of the economic advantages of selecting Kitimat as the port location.
>
> For all alternative port sites, provide a comparative analysis of the risk of oil spill accidents which would arise from the operation of each of the alternatives.
>
> Provide an examination and comparison of alternate marine approach routes to Kitimat. Factors to be discussed should include navigational feasibility, environmental implications and relative probability of accidents which would result in damage to the environment."

Kitimat Pipe Line, Ltd. submitted Volume VII, supplemental information, on April 12, 1977, to the Canadian NEB.

Kitimat Pipe Line, Ltd's response to the Canadian NEB's question regarding alternatives was as follows:

> The proponent has selected Kitimat as the site for its proposed marine terminal for the reasons set forth under the tab "Site Selection" in Volume I of its TERMPOL Submission and in Section IVA of Volume I of its Application to the National Energy Board. The selection was based on a comparative

analysis of navigational and environmental considerations and distance factors.

The proposed marine terminal at Kitimat is an integral part of the pipeline system designed to transport oil from Kitimat to Edmonton which is the subject of a specific application by Kitimat Pipe Line Ltd. to the National Energy Board for a Certificate of Public Convenience and Necessity. The Application will be subject of a public hearing to be heard during the summer. The same Project will also be one of the subjects of the public inquiry to be conducted by Dr. Andrew Thompson. The proponent is committed to the pipeline route from Kitimat to Edmonton and to Kitimat as the location for the marine terminal. Under these circumstances it is submitted that the provision of cost estimates and comparative analyses of the risk of oil spill accidents for alternative port sites would not serve any useful purpose. The proponent is not prepared to propose or undertake a Project different from the one described in its Application to the National Energy Board and its TERMPOL Submission. It is therefore not prepared at this time to commission further studies relating to alternative port sites.

This information was submitted as part of the Kitimat Pipe Line, Ltd. application under Title V of the Public Utilities Regulatory Policies Act on December 5, 1978.

Cherry Point

Bureau of Land Management

## 9.7 Alternatives of Trans Mountain Oil Pipe Line Corporation Proposal

### PORT AND ONSHORE FACILITIES ALTERNATIVES

### CHERRY POINT

Cherry Point is located at the south end of the Strait of Georgia, approximately 10 miles from the Canadian border and 140 miles from the Pacific Ocean (figure 9.7-1). There are two oil refineries, Atlantic Richfield Oil Company (ARCO) and Mobil Oil Company at Cherry Point. The companies have berthing facilities located in 65-foot and 42-foot water depths. Cherry Point is currently served by tankers.

Trans Mountain's Cherry Point alternative includes a new dock immediately north of the existing facilities with two berths, each capable of accommodating up to 200,000 dead weight ton tankers. This alternative also includes an onshore storage facility consisting of eight 500,000 barrel tanks, and a new 30-inch pipeline approximately 28 miles long from Cherry Point to Sumas at the International Boundary. (The alternate pipeline segment is about 15 miles long from Cherry Point to its juncture with the prime route near Laurel. From the International Boundary the new 30-inch pipeline would continue to Edmonton, Alberta.) At Cherry Point a new 12,000 horsepower pump station would be installed.

Construction of this proposal is prevented by amendment to the Marine Mammal Protection Act (PL 95-136).

#### Climate

The general climate of western Washington discussed in Chapter 8 in the section on Meteorological characteristics at Bellingham (located about 12 miles east-southeast of Cherry Point) and Blaine (located about 8 miles north) is considered representative of Cherry Point.

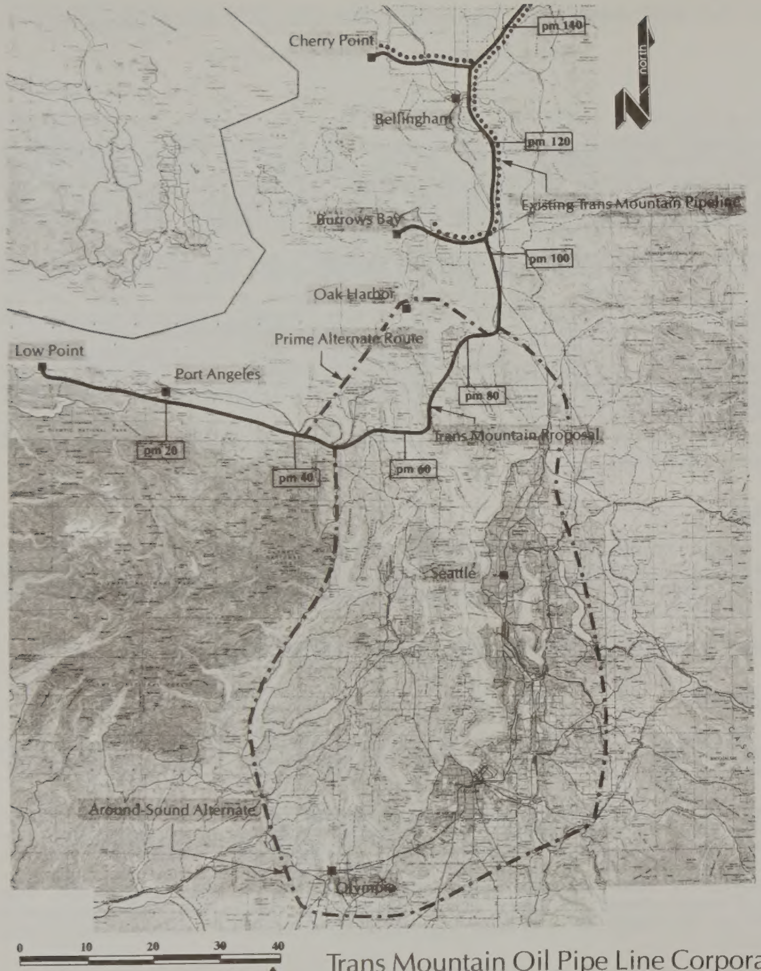
No impacts on climate are anticipated for this alternative port site.

#### Air Quality

The proposed alternate port would be located within the Northwest Air Pollution Authority (NWAPA) Control Region, which includes Island, Skagit, San Juan, and Whatcom Counties.

Construction activities associated with both the tank farm and pipeline would be expected to generate small quantities of air pollutants, primarily dust from excavations and suspended particulates from the exhausts of construction vehicles and workers' automobiles. Construction of the berthing facility would generate quantities of stack gas from construction-related tug activity and exhaust from pile drivers. Except for local areas within the construction sites these pollutants would not be likely to contribute significantly to existing concentrations in the vicinity.

During the operation phase, emissions from the port and onshore storage facilities would be about the same as those for the primary site. No modeling analysis has



Trans Mountain Oil Pipe Line Corporation

Port and Route Alternatives

Figure 9.7-1

been performed for the Cherry Point site. Therefore, no definite assesssment of air quality impacts could be made.

## Topography and Geology

The topography at the onshore storage facility site is fairly level. The topography from Cherry Point to the primary route near Laurel consists of gently rolling uplands and the relatively smooth lowlands of the Nooksack River Valley. Elevations range up to about 260 feet above sea level. Construction of the alternative route would result in relatively minor landscape changes.

Geologic materials at the site of the onshore storage facilities consist of glacial-marine deposits of unsorted, unstratified sandy silt and pebbly clay. The alternate pipeline route would cross glacial-marine, glacial drift, and alluvial deposits on relatively gentle terrain. Potential slope instability problems are identified at about pipeline mile 18. Other slope instability problems possibly exist along the route. No significant geological impacts are expected from construction of this alternate.

The proposed alternate port and pipeline route to the Canadian border are located in an area of moderate to high seismic activity that has been classified as a Seismic Risk Zone 3 (maximum earthquake damage expected). However, no known active surface faults have been identified along the route and only a few significant earthquakes (Modified Mercalli Intensity V or greater) have occurred with epicenters within 10 miles of the proposed facilities. Liquefaction of saturated sands in the Nooksack River Valley is possible, with resultant impacts similar to those described for the proposed route.

## Soils

The onshore storage facilities would be located on soils of the Cagey-Norma association consisting of mainly silty clay loam to loam. These soils occur eastward along the alternate pipeline route toward Ferndale, along with Whatcom, Lynden, and Kickerville soils which include some gravelly to sandy loam. Crossings of the Nooksack River Valley are dominated by Puget soils of silt loam and fine sandy loam texture. The uplands from Ferndale to the Canadian border are comprised mainly of Whatcom and McKenna soils with silt-loam texture.

Impacts to the soils from construction of these alternate facilities would be similar to those described for the proposal. These include disturbance of topsoil; destruction of soil profile along the excavated pipeline trench and at the site of the storage tanks; soil loss through water erosion; minor to negligible loss from wind erosion; and loss of soil productivity. Impacts would be minor and for the most part temporary.

## Aquatic Resources

### Physical Components

No major streams exist at the proposed alternate port and storage facilities.

The proposed alternate pipeline route crosses the Nooksack River northwest of Bellingham and several small streams. The Nooksack River in this area is designated Class A (at the primary route crossing, it is designated Class AA).

Ground water is present along the proposed pipeline route from Cherry Point to the upland areas west of Ferndale, and is contained in glaciofluvial and alluvial deposits. This resource has been developed for domestic, industrial, and municipal use. Recharge by precipitation is in considerable excess of well withdrawal. Ground water in this area is generally excellent. The water is usually low in dissolved solids, although high concentrations of iron do occur in some places. Impacts to surface and ground water during construction, operation, and abandonment of the pipeline are similar to those described for the proposed route. This alternative would cause the least impacts on water resources since approximately 10 stream crossings would occur along this alternative compared with approximately 43 for the proposed route.

### Biological Components

Impacts on fisheries resources for this alternative would be the same as those discussed for the proposed route but would be less damaging since approximately 10 stream crossings would occur compared with 43 along the proposed route.

## Marine Resources

### Physical Components

Currents at Cherry Point are controlled by at least four major factors: 1) tides, 2) meteorological conditions, 3) bottom and shoreline topography, and 4) runoff from the Fraser River. A general counter-clockwise flow of water exists within the southern Strait of Georgia. Approximately every 24 hours there are two high and two low tides. Maximum wave height in the Bellingham area may reach 5.5 feet between October and May (Oceanographic Institute of Washington, 1974). Areas in all parts of the San Juan Islands not exposed to waves from the Strait of Juan de Fuca have maximum wave heights of less than 4 feet. Exposed areas may experience waves and swells of the size prevailing in the Strait. Wave heights are less than 2 feet in the Bellingham-San Juan Islands region (Oceanographic Institute of Washington 1974). Cherry Point's location on the inner north Puget Sound provides a relatively mild wind and wave environment.

Marine water in this area generally consists of seawater flowing into the Strait at depth and less saline surface water from river discharge flowing seaward. Marine water in the southern Strait of Georgia has been designated extraordinary (Class AA). Marine waters in Bellingham Bay, Samish Bay, and Dilla Bay are affected by domestic and industrial waste discharges. These marine waters are considered excellent (Class A).

Impacts on marine water quality would occur during construction of the port. Construction of the offshore unloading facilities would suspend bottom sediments and temporarily degrade water quality. A major oil spill from a tanker or unloading pipeline would degrade marine water quality.

### Oil Spill Risk Analysis

Vessel transit distance from Buoy J to Cherry Point is 126 nautical miles. The risk of an oil spill from an in-transit tanker is expected to be one spill every 2.8 years. The probable size distribution of these spills is shown in chapter 8. The frequency of fire for in-transit tankers is 71.9 years. The frequency for explosions on in-transit tankers is 68.4 years. Bunker barge oil spill frequency for spills greater than 2.4 barrels but less than 10 barrels, is estimated as once every 4.65 years for 205 port calls per year and once every 2.34 years for 407 port calls per year. Oil spill frequency for the onshore storage facility, spills greater than 2.4 barrels but less than 10 barrels, could occur every 2.94 years. Fire and explosion frequency for the onshore storage facility, for damages greater than $1,000 but less than $10,000, is once every 62 years. The annual risk of a spill along the pipeline segment is one spill every 13.77 years (TMC 1979).

Trajectories for hypothetical in-transit or at-berth oil spills in March and September are shown in Map Addendum. Because the Cherry Point spill site is very close to the northern limits of the tidal current and wind mode boundaries, the results are approximate. During March conditions the most probable impact area is the coast along Cherry Point. Southerly transport is possible due to frequent inland high pressure systems during this time. Under these conditions Orcas Island, Sucia Island and Matia Island would be threatened. An oil spill in September would tend to travel rapidly to the northwest and into Canadian waters. If the spills that travel into Canadian water do not beach, there is the possiblilty that they would be entrained in the Fraser River runoff and be transported back into the spill area. Table 9.7-1 gives the shoreline of the most likely initial oil impacts.

TABLE 9.7-1 MOST LIKELY REGION OF FIRST OIL IMPACT 1/

| Spill Site March Conditions | Nautical Miles of Shoreline | September Conditions | Nautical Miles of Shoreline |
|---|---|---|---|
| Birch Point to Cherry Point | 10.0 | Birch Point to Cherry Point | 10 |
| Point Doughty to Racoon Point | 5.0 | | |
| Patos Island | 2.5 | | |
| Sucia Island | 9.0 | | |
| Matia Island | 2.0 | | |
| | 28.5 | | |
| Canada, East Point, Saturna Island | 1.0 | | |

Source: Stewart 1978; Oceanographic Institute of Washington 1979b

1/ At-berth spill: Cherry Point

### Biological Components

Marine biological resources in the vicinity of Cherry Point include, scallops, intertidal hardshell clams, salmon, and bottomfish. The distribution of these resources can be found in Map Addendum. To the north of Cherry Point are winter and spring Pacific herring spawning grounds and habitats for waterfowl. To the south are Pacific herring spawning grounds, Dungeness crab beds, and numerous waterfowl nesting and/or roosting habitats.

No major construction impact could be identified for this alternate port site.

During the operation phase chronic at-berth oil spills would degrade the water quality in the vicinity of Cherry Point. As a consequence, those marine resources having sport and commercial values could become tainted by seawater-soluble fractions of crude oil.

A large in-transit or at-berth oil spill would present serious pollution problems in the Strait of Georgia. The oil-spill trajectories indicate that oil would also affect Canadian marine resources. Of significance would be a landfall of the oil at Sucia Island, a state wildlife refuge, and Matia Island, a national wildlife refuge, and on the northern coastline of Orcas Island. Alden Bank, a harbor seal area, would also be severely impacted. High mortality of herring and marine waterfowl would be expected.

No significant marine impact would occur if the berths were removed during the abandonment phase.

## Terrestrial Vegetation

It is assumed the location of the onshore storage facility would be within a few miles of Cherry Point. This area lies entirely within the Puget Sound Forest Area. It is also assumed that 300 acres of land would be committed to use for the storage facility during the life of the project. This would include agricultural land as well as forested areas.

No federally proposed species of threatened or endangered plants are known to occur in the area. No assessment was made as to the presence of Washington's rare, endemic, threatened, or endangered flora.

The 17 miles of pipeline corridor under this alternative would traverse 2 miles (12 percent) of forested areas and 15 miles (88 percent) of farmland. The corridor would parallel an existing pipeline corridor along its entire length; however, it is uncertain how much of the existing corridor would be utilized for the new pipeline. A construction corridor 90 feet wide would require the clearing of 22 acres of forest and 163 acres of farmland. The maintenance corridor would be somewhat less. The forested areas are mostly second-growth woodlots, with Douglas-fir dominant.

Areas of special concern along this segment include Lake Terrell State Game Refuge and Tennant Lake with its associated marshes. These areas are particularily sensitive to construction and oil spill damage because of the wide variety of animal and plant life which inhabit the marshes.

## Terrestrial Wildlife

The area proposed for the storage facilities supports wildlife associated with agricultural and forest land.

The proposed corridor crosses predominantly farmland, interspersed with small woodlots which provide considerable "edge" habitat. Game species include ring-necked pheasants, California quail, band-tailed pigeon, mourning doves, rabbit, and deer. Species associated with farmland are generally not as sensitive to disturbance as "deep woods" species, so impacts on upland wildlife are not expected to be significant.

Lakes Terrell and Tennant and their adjacent marshes are two important habitat areas close to the proposed route. Lake Terrell, within 0.5 mile of the alternate route, is centered within a 1,051-acre Wildlife Recreation Area. The north end of the lake is a game refuge. The alternate route passes within a mile of Lake Tennant, which is a 100-acre lake and marshland. The east side is owned by the state of Washington, and the west side is a private hunting club. These lakes, marshes, and adjacent agricultural lands are used as a migration stop for waterfowl heading south from British Columbia, and as breeding and feeding areas for pheasant and other resident species. Furbearers, such as beaver and muskrat, also utilize these habitats. A prime concern would be for birds and mammals associated with these wetland areas, which could be disturbed by construction activities particularly during breeding or migration times.

An oil spill during the operation phase could degrade agricultural lands, in addition to polluting local riparian habitat and wetlands around Lakes Terrell and Tennant and endangering migrating, wintering, or resident birds and resident mammals.

Threatened species in Washington include the northern bald eagle and the trumpeter swan. A northern bald eagle nest located in the Neptune Beach area near the Lummi Indian Reservation would be approximately 1 mile from the pipeline corridor. Since the Atlantic Richfield Company refinery and storage facility are already located in the vicinity, no additional disturbance of the nest is anticipated during construction or operation of the alternate port and pipeline route.

## Cultural Resources

The following material is based in part on a preliminary impact assessment and mitigative recommendations prepared by the University of Washington Office of Public Archaeology (TMC 1979).

Current records of prehistoric and historic culture indicate that four currently known cultural resource sites could be affected by this alternative port and pipeline route. The Golgatha Church site (45WH 30) is located on the Atlantic Richfield refinery property and, according to existing archaeological documents, possibly extends into the northwest corner of the proposed onshore storage facilities site. Activities associated with onshore storage facilities construction would disturb the existing topography and could significantly alter any existing archaeological remains. However, areas associated with previous construction of the Atlantic Richfield refinery have already been disturbed. These disturbances may have damaged or destroyed any existing archaeological remains at the site. The precise nature, extent, and condition of this particular site's deposits have not been determined. In addition, there are three prehistoric campsites located on the alternate pipeline corridor approximately at pipleline mile 11.

## Visual Resources

Landscape character in the vicinity of the Cherry Point site is generally rural, except an area that is zoned industrial and is currently used by several industries including Atlantic Richfield, Mobil, Puget Sound Power & Light, and Intalco. Three of these industries have extensive onshore development and berthing facilities in the Strait of Georgia. Most of the surrounding land is agricultural, and no significant recreation areas are located close to the proposed port facilities.

Construction of the onshore storage facility would cause high visual impact for the short-term which would diminish as it blended into the existing oil-related industrial complex.

The alternative pipeline segment traverses generally rural areas within existing rights-of-way. During construction, impacts would be significant until vegetation was reestablished.

## Land Use

Land use in the immediate vicinity of the site is dominated by an existing Atlantic Richfield refinery and ancillary facilities which cover approximately 1,200 acres. Other significant uses of land within a 5-mile radius of the Cherry Point site include:

A 1,400-acre Intalco Aluminum Corporation reduction plant about 2 miles southeast of the proposed onshore storage facility.

A Mobil Oil Company refinery which occupies 840 acres located about 3 miles southeast of the proposed port, adjacent to the Intalco site. Mobil receives crude oil by tanker and ships out much of the finished product through its own dock.

Birch Bay State Park (192 acres), approximately 2 miles northwest of the proposed port.

The Birch Bay resort area north of Birch Bay State Park, which provides for many activities including swimming, boating, fishing, golfing, and horseback riding. About 40 business enterprises are located along Birch Bay Drive. In addition, several hundred cottages serve as second homes. Construction of additional housing units is underway.

The Blaine Air Force Station (about 40 acres) located 3 miles north of the proposed port.

The Lake Terrell State Wildlife Recreation Area, about 2 miles east of the proposed onshore storage facilities, which contains nearly 1,200 acres of land for recreational use.

The Lummi Indian Reservation, located about 4 miles to the southeast. The reservation land is used primarily for agriculture and forestry. An aquaculture project is located on the Lummi Bay side of the reservation.

The alternate port site is generally compatible with adjacent land use, and should not conflict with existing land use in the surrounding area.

The pipeline corridor would traverse agricultural land including pasture, hayfields, and cropland. Construction impacts on farmland would be temporary, and since the alternate pipeline segment would be on existing right-of-way, no changes in actual land use are expected.

No significant impacts on planned land use are expected to occur from the development of facilities associated with the proposed project.

## Transportation and Utility Networks

### Marine Traffic

Tanker traffic to the Cherry Point berthing facility would transit the Strait of Juan de Fuca and Rosario Strait before entering the Strait of Georgia where the berth would be located. Increase in vessel traffic would be significant.

### Roads and Highways

Access to the Cherry Point site is via the existing primary and secondary highway systems that currently service existing industrial facilities in the area. Additional traffic volume generated by construction activity should be similar to that during the construction of the existing refineries and pipeline and less than that generated by the larger Intalco facility.

A work force of 34 would be employed to operate and maintain the proposed facilities at Cherry Point. The impact on existing highway traffic patterns resulting from operation-generated traffic is expected to be negligible.

### Railroads

Two major rail lines, the Burlington Northern and the Milwaukee Railroad, provide service to the Cherry Point area. Most construction materials for the port and pipeline would be shipped to staging areas by truck. It is anticipated that limited delivery of construction materials by rail should place no undue burden on existing railroad facilities. No significant adverse effects on railroad systems are expected.

### Airports

The Bellingham International Airport provides commuter air service to the area. Project-related use of available air services in the area is expected to be minimal. With the possible exception of some minor personnel movements, construction and operation movements would use other transportation. The proposed project is expected to cause no significant impacts on existing air traffic flow patterns.

### Electrical Facilities

Approximately 10 MW would be required to run pumps at the onshore storage facilities, decreasing the area's electrical power supplies.

### Recreation

Construction of the port facility is not expected to significantly alter the recreational opportunities or interests in the area.

Operation of the berthing facility would increase tanker traffic in the vicinity of Cherry Point. The tankers would be operating in an established traffic lane for commercial vessels, so pleasure boaters would not have to cope with new, commercial uses of the waterways.

A major oil spill at Cherry Point could affect sport salmon fishing in the area. Nonsalmon sport fishing could be impacted from Boundary Bay to the vicinity of Orcas Island. Offshore shellfishing would be lost from Boundary Bay to Orcas Island for a minimum of 4 years. Recreational home development in the area could be damaged by oil-polluted beaches and loss of visual quality. A minimum of 20 shore-side recreational parks and marinas could be impacted. Oil-fouled gear and boats and diminished recreational suitability could affect an indeterminate number of recreationists. Use of three vicinity parks in 1978 was 1.5 million visits. Pipeline leaks or ruptures could have major impacts on inland recreational resources, such as Lakes Terrell, and Tennant. Oil contamination of the Nooksack River would be considered a serious impact by the State of Washington. The Nooksack River is afforded protective status by the Shorelines Management Act of 1971.

### Social and Economic Conditions

The Cherry Point alternate port and pipeline segment would have socio-economic effects primarily in Whatcom County. The area surrounding the site is largely urban and industrial, with oil-related industries currently operating in the vicinity. The closest urban area is Bellingham, which is 12 miles from the proposed port facility.

Construction would take place over a 20-month period, with peak employment of about 400 workers. As much as 50 percent of the labor force might come from outside the local area. Approximately 22 percent (44 of these 200 nonlocal workers) would establish temporary residence in the area. Fifty-nine percent of the nonlocal workers (118 workers) would commute to the area on a weekly basis, returning to nonlocal residences for the weekend. The remaining 19 percent of the nonlocal workers (38 workers) would commute on a daily basis from outlying areas. A population increase of 982 persons could result from construction. This increase in the county population is not considered to be significant.

The temporary housing market (hotels, motels, and camping facilities) in Whatcom County would be strained for a relatively short duration during peak construction (approximately 3 months). Competition with tourists for transient housing and trailer parks would occur during the summer.

Construction of the facility is not expected to significantly influence either the overall level of employment in the county or the average per capita income. However, the project would provide a short-term stimulus to the construction and related industries, and unemployed workers may find work as a result of the project.

Operation of the terminal, storage, and pipeline facilities at Cherry Point would create about 36 new jobs. No significant impacts on county employment characteristics are expected as a result of employment associated with operation and maintenance of the facilities.

Assuming all of the operation personnel relocated in Whatcom County, the additional 36 families could cause an increase of 38 school-age children (assuming 1.46 children/ household with 72 percent of these of school age). The Bellingham School District has existing capacity for 40 additional students. Some of the 38 school-age children would probably attend schools located in other school districts in Whatcom County. The resulting increase of 38 school-age children in a system with an enrollment of 18,000 students should cause no appreciable effects on public schools.

No significant impacts to medical facilities or fire and police protection are expected from construction or operation.

Projected sales tax revenue from project construction would amount to approximately $4,690,400 for the state, and $509,830 for Whatcom County. The estimated capital cost for the system is $101,966,000 in Whatcom County (port and pipeline). Estimated annual property tax revenues are shown in table 9.7-2.

TABLE 9.7-2 PROPERTY TAX REVENUES FOR CHERRY POINT ALTERNATE
(in thousands)

| County Port and Pipeline Construction Cost January 1, 1979 Estimate | Equalization Ratio | Assessed Valuation | Equalized Value of all Real and Personal Taxable Property (1978 Local Tax Base)1/ | Assessed Valuation of Route Percent | Average Tax Rate2/ | Estimated Tax Yield |
|---|---|---|---|---|---|---|
| Whatcom $101,9663/ | 77.2 | $78,717.6 | $2,414,431.7 | 3.3 | 14.48 | $1,139.8 |

1/ Washington Department of Revenue 1979
2/ Assumes that tax levy rates would not decrease as a result of the increase in assessed valuation attributable to the project
3/ TMC 1979

## BURROWS BAY

This alternative considers a port at Burrows Bay, where all crude oil arriving by tanker would be unloaded and moved by pipeline to the onshore storage facility. This alternative includes a sea island type berth with pipelines to shore, and a storage facility consisting of eight 500,000 barrel tanks, and a booster pump station.

Tankers at berth would discharge crude oil to a booster pump station onshore which would pump the oil through a 48-inch pipeline approximately 7 miles to the onshore storage facility. The onshore storage facility would be located at March Point adjacent to the existing Trans Mountain pipeline. From March Point a new 30-inch pipeline would run within the existing Trans Mountain right-of-way to the international boundary at Sumas, approximately 51 miles (see figure 9.7-1.

Construction of the transshipment port at Burrows Bay is prevented by an amendment to the Marine Mammal Protection Act (PL 95-136).

## Climate

The general climate of western Washington has been previously discussed in the Cherry Point alternative.

No impacts on climate are anticipated for this alternative port site.

## Air Quality

Data for this area indicated that Anacortes and March Point, the closest industrial areas to Burrows Bay, were occasionally in violation of the ambient $SO_2$ standards. No ambient air quality standards were being violated at Burrows Bay. The Washington Environmental Profile (EPA 1978) indicates that there is no evidence that the primary $SO_2$ standard is being violated in Skagit County.

During the operation phase, emissions from the port and onshore facilities would be similar to those associated with the primary site. No air quality modeling was performed for the Burrows Bay site. No quantitative determination of impacts on air quality can be made.

## Noise

Construction and abandonment activities would temporarily increase noise levels. Noise generated during operation of the marine terminal would be primarily due to the booster pumps at the unloading dock (about 64 dBA at 100 feet). These noise increases could affect rural residents near the proposed facilities.

## Topography and Geology

The topography along this alternate route varies from moderately steep hills to broad flat lowlands. From the sea island berth to the storage facility, elevations range from sea level to 250 feet. The storage facility site at March Point is at an elevation of about 30 feet. From here the proposed pipeline segment descends to sea level at the Skagit Flats. The route crosses about 10 miles of the Skagit Valley and gradually rises to an elevation of about 15 feet where it joins the proposed route.

Construction, operation, and abandonment of an oil port at Burrows Bay and the attendant pipeline would result in relatively minor topographic impacts, consisting largely of landscape alterations.

The geologic materials on Fidalgo Island in the vicinity of the port and pipeline route are varied in composition. Near Alexander Beach pre-Devonian intrusive rocks (mainly diorite) occur at or near the surface and extend into the middle of the island. Along the eastern side of the island, Mesozoic sedimentary and volcanic rocks crop out at the surface. Scattered deposits of Quaternary glacial drift occur on top of the bedrock along the pipeline route across the island.

Recent age alluvial deposits form the surface materials along the pipeline route across the Skagit lowland.

Harbor materials appear to be a thin deposit of mud and sand underlain by bedrock; no significant impacts have been identified. No significant impacts to the physical geology have been identified along the alternate pipeline route.

The Burrows Bay alternate port and the pipeline from the port to the Canadian border are located in an area of moderate to high seismic activity, classified as a Seismic Risk Zone 3 (maximum earthquake damage expected). However, no known active surface faults have been identified near the proposed alternate facilities. Less than 10 significant earthquakes (Intensity V or greater) with epicenters within 10 miles of the proposed pipeline route have occurred since about 1841. Potential liquefaction of saturated sands in the Skagit lowland is possible, but site investigation would be required to substantiate whether this hazard exists along the pipeline route.

## Soils

The soils at the alternate port and along the pipeline route to Fidalgo Bay are mostly shallow, very rocky, and overlie bedrock. Soils along the segment of pipeline east of Fidalgo Bay and in the Skagit lowland are predominantly silt loam and loam in texture with 0-3 percent slopes. Dominant soils are Puget, Puyallup, and Sumas. Impacts to the soils from construction of the alternate facilities would be greatest in the steep-sloped and rocky soils on Fidalgo Island. Soil losses resulting from construction along the nearly level segment of the route east of Fidalgo Bay would be minimal. Vegetation is expected to reestablish quickly in disturbed areas.

## Aquatic Resources

### Physical Components

The proposed alternate port, onshore storage facilities, and pipeline segment would not be located adjacent to or across any major surface water bodies. Ground water may be contained in the glaciofluvial and alluvial deposits to the east of Burrows Bay along the proposed pipeline route. Potential impacts to near-surface ground water in glaciofluvial and alluvial deposits along the pipeline segment would be similar to those discussed in Chapter 8. This alternative would cause impacts to approximately 15 streams compared to 43 for the proposed route, resulting in lesser impacts on water resources than those of the proposed route.

### Biological Components

Stream crossing locations and fishery resources along this pipeline segment would be the same as the last 10 identified in Chapter 8. Several other crossings would also occur. This alternative would cause lesser impacts on fisheries resources than the proposed route since it would impact fish in about 15 locations compared with 43 for the proposed route.

## Marine Resources

### Physical Components

Entrance to Burrows Bay can be achieved through channels between Fidalgo Head and Burrows Island (controlling depth of 90 feet); between Burrows Island and Allan Island (controlling depth of 108 feet); between Allan Island and Williamson Rocks (controlling depth of 198 feet); or between Williamson Rocks and Langley Point (controlling depth of 196 feet).

Between October and May, areas sheltered from the Strait of Juan de Fuca would experience maximum wave heights of less than 4 feet. Exposed areas might experience waves prevalent in the eastern Strait of Juan de Fuca. The tidal currents and tidal ranges within Burrows Bay would be similar to those at the entrance to Rosario Strait and in the Strait of Juan de Fuca. Currents may attain speeds of 2 to 5 knots varying with the tidal range and the influence of wind (OIW 1974).

Marine water in Burrows Bay is a mixture of ocean and river water. Flushing action in Burrows Bay by currents may be somewhat restricted due to the presence of Burrows and Allen Islands to the west. Therefore, water quality characteristics may be somewhat different from those occurring further offshore in Rosario Strait. Burrows Bay and adjacent marine water has been designated Class AA. Water quality impacts would be similar to those discussed in Chapter 8.

### Oil Spill Risk Analysis

Vessel transit distance from Buoy J to Burrows Bay is 93 nautical miles. The annual frequency of an oil spill is expected to be one spill every 3.83 years. The size distribution of these spills is shown in Chapter 8. The estimated frequency of fire for in-transit tankers is expected to be 97 years and the estimated frequency for explosions in in-transit tankers is expected to be 93 years. A bunker barge spill, greater than 2.4 barrels but less than 10 barrels, could occur once every 4.65 years for 205 port calls and once every 2.34 years for 407 port calls. A tank farm spill, greater than 2.4 barrels but less than 10 barrels, could be expected once every 2.94 years. Fire and explosion at the storage facility, for damages greater than $1,000 but less than $10,000, could be expected once every 62 years. The frequencies of magnitudes for oil spills, bunker spills, and fire and explosion can be found in Chapter 3. The frequency of oil spills for the pipeline segment is expected to be one spill every 7.58 years (TMC 1979).

Tankers approaching Burrows Bay from the Strait of Juan de Fuca must pass over a rapidly shoaling area between Point Colville and Lawson Reef. At this location a hypothetical in-transit tanker grounding was considered to occur during March and during September oceanographic and meteorologic conditions. No estuarine flow was included in the trajectories simulation model since little is known about the flows in this region. The trajectories are shown in Map Addendum. A March grounding and oil spill would initially impact the shorelines of Allan and Burrows Islands, the shoreline from Iceberg Point on Lopez Island to Decatur Head on Decatur Island and all the shoreline of Smith Island. A September grounding and subsequent oil spill, the same shorelines, except Smith Island, could be initially impacted. Table 9.7-1 gives nautical miles of shoreline most likely to be initially impacted.

The initial shoreline impact could occur at Flounder Bay 2 hours after the spill during a neap tide. After 8 hours the oil spill could move along the western shoreline of Fidalgo Island to Langley Point. The initial shoreline impacted would be about 3.8 nautical miles. During a spring tide the initial shoreline that might be impacted is southeast of Flounder Bay after 8 hours. However, there is a possibliity that the eastern shoreline of Allan Island could be impacted 6 hours after the spill. The initial shore impacted would be about 2 nautical miles.

TABLE 9.7-3 MOST LIKELY REGION OF FIRST OIL IMPACT FOR A SPILL AT THE ENTRANCE TO ROSARIO STRAIT

| Spill Site | March Conditions | Nautical Miles of Shoreline | September Conditions | Nautical Miles of Shoreline |
|---|---|---|---|---|
| Entrance to Rosario Strait | Allan Island | 2.3 | Allan Island | 2.3 |
| | Burrows Island | 2.8 | Burrows Island | 2.8 |
| | Iceberg Point to Decatur Head | 9.5 | Iceberg Point to Decatur Head | 9.5 |
| | Smith Island | 1.0 | | |
| | | 15.6 | | 14.6 |

Source: Stewart 1978; Oceanographic Institute of Washington 1979b

### Biological Components

Burrows Bay marine habitats are eelgrass beds, rock, mud, and open water. Numerous waterfowl and a high salmon population are found in the bay. Concentrated purse seine fisheries are concentrated in the northern part and at the entrance to the bay. Gill net fishing is concentrated in the southern approach. Sport salmon fishing is found throughout the bay. Bottomfishing is concentrated around Allan and Burrows Islands and within all passages into the bay Shrimp are concentrated in Burrows Bay. The general distribution of marine biological resources in the bay and adjacent Rosario Strait and Strait of Juan de Fuca can be found on the marine resource maps in the Map Addendum. Concentrations of waterfowl and of marine mammals in the vicinity of Burrows Bay are also indicated on the marine resource maps.

Construction of the submarine line would degrade water quality in the bay, entrance to Rosario Strait, and the eastern part of the Strait of Juan de Fuca. Suspended solids would create turbid water conditions. Organic debris, heavy trace metals, and chlorinated hydrocarbons absorbed on clay minerals could also contribute to marine water quality degradation.

Chronic oil spills during in-transit and at-berth operations would degrade the water quality in the bay and the adjacent straits. Such spills could result in tainting of harvestable marine resources and reluctance of sports and commercial fishermen to utilize the bay.

A submarine pipeline rupture would have a significant impact upon the bay, Rosario Strait, San Juan Archipelago, and the central basin of the Strait of Juan de Fuca. Water quality would be degraded until the oil is dispersed by natural processes. High waterfowl mortality could be expected and tainting of shrimp, intertidal clams, and crabs might occur in the affected areas. Sports and commercial salmon and bottomfishing harvests could also be severely curtailed.

## Terrestrial Vegetation

It has been proposed that the onshore storage facilities would be located near March Point. Most of the lowlands (below 100 feet) of the March Point peninsula are agricultural, with the highlands being occupied by forest of Puget Sound Forest Area. It is assumed that 300 acres of land would be necessary for storage purposes, as with the preferred location. Although no estimate of percent forest and percent agriculture can be given, it is likely that the majority of the area is occupied by agricultural lands. These lands would be removed from production for the life of the project. The impacts associated with the construction, operation, and abandonment of onshore storage facilities are addressed in chapter 8.

No federally proposed species of threatened or endangered plants are known to occur in the area. No assessment was made as to the presence of absence of Washington's rare, endemic, threatened, or endangered flora.

If a major oil spill occurred at the storage facilities, and the spill were to reach Padilla Bay, the Skagit River delta and salt marsh could be impacted. This area supports a wide diversity of wildlife and has been nominated for Natural Landmark status.

The 14 miles of pipeline corridor under this alternative traverses 6 miles of forest (43 percent) and 8 miles of farmland (57 percent). The pipeline parallels an existing pipeline corridor for about half of its length; however, it is not clear how much of the existing corridor would be utilized for the new corridor. Assuming no overlap, a construction corridor 90 feet wide would be necessary, requiring clearing of 65 acres of forest and 88 acres of farmland. The corridor maintained clear of vegetation for the life of the project would be somewhat less.

The impacts associated with construction, operation, and abandonment of a pipeline system is addressed in chapter 8.

One species which has been proposed for threatened status on a 1978 federal list by Ayensu & Defilips, Castilleja parviflora var. olympica, is known to occur on Fidalgo Island, north of Lake Campbell. No surveys have been conducted along the pipeline corridor to determine if this species is present. No determination was made as to the presence or absence of plants which are considered to be rare, unique, threatened, or endangered within the State of Washington.

An area of special concern along this pipeline route is the Skagit River delta and saltwater marsh. This area is particularly sensitive to construction and oil spill damage because of the wide variety of animal and plant life which inhabits the marshes. This area has also been nominated for Natural Landmark status.

## Terrestrial Wildlife

Terrestrial wildlife at the alternate port and along the alternate pipeline segment includes those species typical of agricultural, forest, and wetland habitats. A small amount of wetland habitat is crossed by this alternate route. The right-of-way would be initially cleared of vegetation, but with revegetation, wildlife would be expected to repopulate the area.

The corridor would cross Fidalgo Island which has extensive woodland tracts. A high concentration of resident and wintering bird species occupy inland habitats. The island's location along the coastal flyway route provides habitat for migratory waterfowl and shore birds. Fidalgo and Padilla Bays are frequented by bird watching and nature study groups. Game species include a medium to high deer and grouse density.

An estimated 140 acres of agricultural habitat near Widmarsh Junction would be cleared for construction of the storage facility. This habitat would be lost for the duration of the project.

Construction noise and dust may cause some short-term disturbance to wildlife. The existing right-of-way parallels a highway and railway so operational activities are not anticipated to cause any significant increase in the present level of disturbance to area wildlife.

Construction activities may disturb migratory and resident birds and resident mammals inhabiting nearby wetlands and bay areas, especially during breeding seasons.

Northern bald eagles occur along the coastal area of Rosario Strait. The Fidalgo and Padilla Bay areas are particularly noted as prime eagle habitat. These birds would probably avoid these areas during construction.

Oil spills and drainage into nearby wetland areas would adversely impact wildlife.

## Cultural Resources

The cultural resource sites listed in table 9.7-4 are found near this port alternate and pipeline route segment. There is high potential for discovery of additional archaeological and historical sites in the proposed construction areas, especially along the shoreline.

## Visual Resources

Construction of the port facilities would create a short-term high visual impact on the shoreline. Tanker movement is common in the area.

The storage facilities would require the clearing and leveling of approximately 140 acres and would cause a significant visual intrusion during construction; however, the impact would be short-term due to the present oil-related industry in the area.

The pipeline from Burrows Bay to the junction with the proposed route at Bayview would traverse rural areas on Fidalgo Island and then parallel the existing pipeline from March Point. Construction activities would cause temporary visual disruption. Operational impacts would be incremental along the existing pipeline right-of-way.

TABLE 9.7-4 ARCHAEOLOGICAL AND HISTORICAL SITES FOR BURROWS BAY PORT AND PIPELINE ROUTE SEGMENT

| County | Site Name | Site Type | Approximate Location |
|---|---|---|---|
| Skagit | 45SK16 | Shell midden | Allan Island |
| | Burrows Island light station 1/ | Historic lighthouse | Burrows Island |
| | 45SK42 | Shell mound | Pipeline Mile 3 |
| | 45SK43 | Shell mound | Pipeline Mile 3 |
| | 45SK45 | Shell mound | Fidalgo Bay |
| | 45SK 1 | Shell mound | Similk Bay, Pipeline Mile 5 |
| | 45SK17 | Shell midden cairn and burials | Similk Bay |
| | 45SK18 | Shell midden | Similk Bay, Pipeline Mile 6 |
| | 45SK58 | Campsite | Pipeline Mile 12 |
| | 45SK67 | Artifact locality and possible trail | Pipeline Mile 13 |
| | 45SK90 | Habitation site | Pipeline Mile 14 |

Source: TMC 1979

1/ Listed in National Register of Historic Places.

## Land Use

Allan and Burrows Islands and most of Fidalgo Island are presently rural in their land use. Skagit County has zoned the islands residential, as much of the land is marginal for agricultural production. Second home recreational developments are beginning to appear on Fidalgo Island, and are expected to continue to increase in number. The number of private property owners on the islands would increase as population increases, resulting in parcelization of land in the rural areas.

Private property owners comprise the largest land ownership category on Allan, Burrows, and Fidalgo Islands. Anacortes owns the property surrounding the Mt. Erie watershed, making the city the second largest landowner on Fidalgo Island. The State of Washington owns and operates Deception Pass State Park on the southern tip of Fidalgo Island. The only federally owned land occurs on a small portion of Burrows Island where the U.S. Coast Guard maintains a lighthouse station.

Only small portions of Fidalgo Island are currently industrialized, including March Point (already occupied by oil refinery facilities), and the west side of the Swinomish channel. The port at Burrows Bay would introduce an industrial land use into a relatively undeveloped coastline area.

The pipeline from the port facility at Burrows Bay to Whitmarsh Junction would traverse primarily undeveloped, rural land. Agriculture is not a prime land use in this area due to slope and soil management problems. From Whitmarsh Junction east to the prime route, the pipeline follows TMC's existing right-of-way. Temporary, short-term impacts, such as disruption of one growing season where farmland is crossed to nuisance-related effects in residential areas, would result from construction activities. Operational impacts would represent the incremental expansion of an existing land use.

## Transportation and Utility Networks

Vessel traffic congestion would not likely be a problem in Rosario Strait and Burrows Bay.

Highway access to Burrows Bay is limited to a two-lane roadway from Anacortes. Construction traffic would cause significant lowering of service levels on roadways and in nearby Anacortes where the nearest railroad is located.

Electric power demand for the Burrows Bay alternate would be approximately 10 MW, decreasing the regional electric power supplies.

## Recreation

The Washington Marine Atlas (1974) indicates that most of Burrows Bay is used as a sport salmon fishery, with particularly heavy fishing occurring in the vicinity of Langely Point. The western half of Burrows Bay and Allan Island are used as a nonsalmon sport fishery.

Burrows Bay is the site of a large number of vacation homes and other recreational developments. As such the entire area is used extensively for recreational boating. Skin diving occurs primarily off Burrows and Allan Islands. Several freshwater lakes are in the study area (Campbell Lake, Crater Lake, Lake Erie, Whistle Lake, and Hart Lake).

The tanker berthing facilities in Burrows Bay would be visible from boating areas offshore and from some recreational homes onshore. Tankers are not uncommon in this area. It is anticipated that no significant impacts to recreational activities would occur as a result of normal construction, operation, or abandonment activities associated with the berthing facilities or the pipeline. In the event of an oil spill, recreational activities would be curtailed for the duration of cleanup activities. Pleasure boating, bottom and salmon fishing in Burrows Bay, recreational shrimping and scuba diving are some of the activities that would be affected.

Construction of the pipeline segment from Burrows Bay to Whitmarsh Junction would disrupt recreational activities. Operational impact would not be significant. The pipeline from Whitmarsh Junction to the junction with the prime route follows existing rights-of-way. Construction and operation would represent incremental impacts of minor significance.

## Social and Economic Conditions

The Burrows Bay alternative port and pipeline segment would primarily affect socioeconomic conditions in Skagit County, and to a less extent in Island County. It is assumed that labor force requirements and capital cost to construct and operate this alternative port, onshore storage and pipeline facilities would be essentially similar to the Cherry Point alternative.

Construction would take place over a 20-month period, with peak construction employing about 400 workers. Assuming that 50 percent of the labor force is nonlocal, a population increase of 982 persons could occur in Skagit County as a result of construction. This represents a minor increase in total county population and is not considered significant.

The temporary housing market (hotels, motels, and camping facilities) in Whatcom County would be strained for a relatively short duration during peak construction (approximately 3 months). Competition with the tourist trade for transient housing accomodations and trailer park space would undoubtedly occur during the summer.

Construction of the facility is not expected to significantly influence either the overall level of employment in the county or the average per capita income. However, the project would provide a short-term stimulus to the construction and related industries and county unemployment may be reduced as a result of the project.

Operation of the facilities would create about 36 new jobs in Skagit County. No significant impacts on county employment characteristics are expected as a result of employment associated with operation and maintenance of the facilities.

If all of the operations personnel were to relocate to Skagit County, the additional 36 families could result in an increase of 38 school-age children (assuming 1.46 children/household with 72 percent of school age). Most of the schools in the area are already operating above capacity and would experience incremental increases in overcrowding as a result of the proposed project.

Community services in Anacortes would not be significantly impacted by the project.

No significant impacts are expected on medical facilities or fire and police protection from construction or operation of the alternate port and pipeline.

Projected sales tax revenue from project construction would amount to approximately $5,839,380 for the state, $529,120 for Skagit County, and $105,590 for Whatcom County.

The estimated capital cost for the system is $105,824,600 in Skagit County (port and pipeline) and $21,118,500 in Whatcom County (pipeline only). Estimated annual property tax revenues are shown in table 9.7-5.

TABLE 9.7-5 PROPERTY TAX REVENUES FOR BURROWS BAY ALTERNATE
(in thousands)

| County | Estimated Value of Construction Cost (January 1, 1979 Value) | Equalization Ratio | Assessed Valuation | Equalized Value of all Real and Personal Taxable Property (1978 Local Tax Base)[1] | Assessed Valuation of Route as Percent of Total County | Average Tax Rate[2] | Estimated Tax Yield |
|---|---|---|---|---|---|---|---|
| Skagit (port and pipeline) | $105,824.6 | 80.9 | $85,612.1 | $1,336,766.5 | 6.4 | 15.72 | $1,345.8 |
| Whatcom (pipeline only) | $21,118.5 | 77.2 | $16,303.5 | $2,414,431.7 | 0.7 | 14.48 | $236.1 |

Source: TMC 1979

[1] Washington Department of Revenue 1979.

[2] Assumes that tax levy rates would not decrease as a result of the increase in assessed valuation attributable to the project.

Burrows Bay

## PORT ANGELES

BLM considers Port Angeles to be an alternative to the TMC proposed port at Low Point. The TMC proposed crude oil transportation system could utilize tanker berthing on Ediz Hook and onshore storage facilities on Green Point as proposed for the NTPC system.

TMC proposes a 630,000 barrels per day ultimate throughput pipeline system which would require unloading facilities, two submarine pipelines, and an onshore storage facility. BLM determined that the TMC system could use a fixed berth unloading facility, located on Ediz Hook, capable of unloading two 200,000 dead weight ton class tankers simultaneously. Two submarine pipelines, approximately 48 inches in diameter, would transport the crude oil to the onshore storage facility, possibly located on Green Point. This facility, similar to the Low Point proposal, would require about 240 acres of land and be capable of storing 4 million barrels of crude oil for delivery into the proposed pipeline system. This pipeline system and route, except for the initial 28 miles, would be same for TMC as proposed in chapter 1 and described and analyzed in chapter 8.

Construction impacts for the tanker unloading facility on Ediz Hook, the two submarine pipelines and the onshore storage facility on Green Point would be similar to impacts described for the NTPC system in chapter 3.

Operational impacts on marine resources and water quality at the Port Angeles unloading facilities would be similar to the impacts for the proposed NTPC system.

Comparative oil spill risk analysis for the NTPC system shows little difference between Port Angeles and a single point mooring at Low Point using throughput capacities of 709,000 and 933,000 barrels per day. Low Point is preferable from an in-terminal risk standpoint, and Port Angeles from an at-berth risk standpoint. The in-transit advantages at Low Point must be weighed against the disadvantages of exposure to weather and sea conditions of the SPMs as opposed to the shelter of Port angeles harbor.

The ultimate throughput fpr TMC (630,000 bpd) is lower than the initial throughput (709,000 bpd) proposed by NTPC. Therefore, the oil spill risk for in-transit and at-berth, whether using a single point mooring at fixed berth, would be somewhat less than the risk associated with the initial throughput.

These conclusions for operational impacts of the TMC system using the Port Angeles port site were based upon judgments about the Low Point and Port Angeles sites, using OIW (1978a, b, and c) oil spill risk analyses developed for the NTPC system. The comparisons could be considered acceptable for preliminary analysis of environmental impacts; however, no incremental and combined oil spill risk analyses have been made for the TMC port if located in Port Angeles harbor.

## ROUTE SEGMENT ALTERNATIVES

### PORT WILLIAMS, WHIDBEY ISLAND, CAMANO ISLAND

### (Across Puget Sound)

This alternative pipeline route segment would depart from the proposed route near Morse Creek at pipeline mile 25, and head northeast then east to the Port Williams area (figure 9.7-1). A 14-nautical-mile submarine crossing of the eastern Strait of Juan de Fuca would then be made to Point Partridge on Whidbey Island. On the Island, the route would head north-northeast to a point north of Oak Harbor and south of the U.S. Naval Reservation, and then west to a location near Strawberry Point. A submarine crossing of Saratoga Passage to Brown Point on Camano Island would then be made. The pipeline route would then head southeast to Stanwood, where it would join the proposed route at pipeline mile 83. Total distance for this alternate route would be 52 miles compared to 58 miles for the proposed route.

#### Climate and Air Quality

Climate and air quality conditions and impacts along the pipeline route alternative would be similar to those discussed for the proposed route. Fewer areas would be impacted by fugitive dust because less land area would be crossed by this route.

#### Noise

Noise generated from construction, operation, and abandonment procedures would be very similar to noise generated for the primary pipeline route. The rural residences near the alternate route would experience temporary high levels of noise during construction and abandonment.

#### Topography and Geology

The portion of the alternative pipeline segment on the Olympic Peninsula traverses gently rolling to nearly level glaciated uplands between an elevation of about 80 and 350 feet. From north of Port Williams to Whidbey Island the sea bottom depths range to about 300 feet. Across Whidbey Island the alternative route traverses rolling glaciated uplands between elevations of about 50 to 450 feet. From Whidbey Island to Camano Island the depth is about 60 feet. On Camano Island the route crosses glaciated uplands with elevations to 150 feet.

Construction of a pipeline along this alternative route segment would result in relatively minor topographic impacts similar to those discussed for the prime route and would consist primarily of landscape changes ranging from 10 to 25 acres/mile.

The land portions of the alternate pipeline segment are underlain by glacial drift primarily consisting of till and outwash and glacial-marine sediments. The sea bottom is composed of a variety of materials including rock, mud, sand, and gravel.

Impacts to the physical geology would consist primarily of minor alteration of geologic materials from excavation of the pipeline trench. During construction the potential for erosion and slope failure would increase slightly. The coastline north of Port Williams is considered unstable.

The entire route lies within Seismic Risk Zone 3 (maximum earthquake damage expected). The area has not felt an historical earthquake greater than Modified Mercalli Intensity VI. Seismicity and slope stability problems along this alternate route would be similar to those for the proposed route.

## Soils

The soils along the alternative route segment are predominantly deep gravelly, and loamy soils on glacial uplands. Along the Olympic Peninsula portion of the route, dominant soils are Elwha and Clallam loams. On Whidbey and Camano Islands, Whidbey and Hoypus gravelly loam and Bow loam are dominant. Slopes along the route generally range between 0 and about 30 percent.

Adverse impacts to soils from construction would be minor and similar to those discussed for the comparable segments of the proposed route.

## Aquatic Resources

### Physical Components

The alternate pipeline crossing of the Dungeness River and adjacent small streams are farther to the north than the proposed pipeline crossings. Water quality characteristics in these segments of the river and streams are not likely to be significantly different from those described for the proposed route.

Impacts on surface and ground water caused by construction and operation of the alternate pipeline segment would be similar to the impacts for the proposed route. Cumulative impacts on water quality would be less than for the proposed route since five fewer stream crossings would occur (12 for the proposed route and 7 for this alternative).

### Biological Components

This alternative route segment would cross seven streams supporting fisheries resources (table 9.7-6). Five of these streams are also crossed in the proposed route, but farther upstream. Two additional streams, Cassalery and Gierin Creeks, support searun trout and possibly coho and chum salmon. Impacts on fisheries resources would be less than for the proposed route where 12 streams would be impacted.

TABLE 9.7-6 PIPELINE CROSSING LOCATIONS ON SELECTED WASHINGTON STREAMS AND AFFECTED HABITATS, HATCHERIES, AND FISHERIES

| Main Stream | Approximate Pipeline Mile 1/ | Miles of Spawning Habitat 2/ | Significant Spawning Habitat 3/ | River Mile Crossing Location 4/ | Name and Location of Hatchery Facility 5/ | Indian Fishery 6/ | Remarks |
|---|---|---|---|---|---|---|---|
| Across Puget Sound Route Segment | | | | | | | |
| Bagley Creek | 25 | 0.1 | — | 1.8 | | | |
| Siebert Creek | 26 | 8 | — | 2.0 | | | Culverts for partial barriers at times. Irrigation water diverted at RM 3.1 |
| McDonald Creek | 28 | 5.2 | — | 1.75 | | | |
| Matriotti Creek | 33 | — | — | 3.5 | | | |
| Dungeness River | 34 | 34 | 0-16 | 4.25 | Dungeness Salmon Hatchery at RM 10.5 with a satellite station at Hurd Creek (RM 2.9) | Lower Elwha Tribe fishery primarily below the crossing | |
| Cassalery Creek | 35 | — | — | 3.0 | | | |
| Gierin Creek | 36 | — | — | 1.5 | | | "Some favorable gravel habitat." |

Sources: PNRBC 1970; Williams et al. 1975; Phinney and Bucknell 1975

1/ Approximate pipeline mile where crossing would occur.

2/ Approximate number of miles of spawning and rearing habitat for anadromous and resident salmon and trout on stream mainstem. Includes areas both upstream and downstream from proposed pipeline crossing.

3/ Location of significant spawning areas for anadromous and resident salmon and trout by river mile.

4/ Approximate location of proposed pipeline crossing by river mile from the mouth.

5/ Name and location of hatchery. River mile number is that of the main stream where fish released from the hatchery would enter.

6/ Name and location of Indian river fishery. Additional Indian fisheries currently in litigation.

7/ — line means no specific data were located in the sources referenced.

## Marine Resources

### Physical Components

Infrequent extreme wave heights can reach 15 feet, and current velocities off Dungeness Spit to Point Partridge can reach 1 to 3 knots during ebb tide. In Saratoga Passage, maximum flood currents are about 0.3 knots while maximum ebb currents are around 0.5 knots (U.S. Department of Commerce 1973). Physical and chemical oceanographic conditions in the Strait of Juan de Fuca in the corridor crossed by the alternative pipeline segments are similar to the proposed route.

Marine water classification for the Strait of Juan de Fuca is considered extraordinary. Marine water in the Whidbey Basin (Skagit Bay, Saratoga Passage, etc.) is considered excellent (Washington State Department of Ecology 1977). The difference in water classification is a result of restricted flushing, industrial, domestic, and agricultural input into the Basin.

Impacts on marine water quality would be similar to those for the proposed route. However, the alternate Puget Sound crossing would be several miles longer than either of the crossings for the primary route. Therefore, burial of the pipeline would suspend more bottom sediments and marine water quality could be degraded.

The submarine pipeline crossing would pass under ship traffic lanes, and a navigational precautionary area. A ship in distress, due to loss of engines or steerage, would probably drop anchors. Should this occur in the traffic lanes or in the precautionary area, there is the possibility of a submarine pipeline rupture caused by anchor dragging.

### Oil Spill Risk

Employing the risk analysis methodology, the spill exposure along this alternate route segment are shown in table 9.7-7.

TABLE 9.7-7 ESTIMATED FREQUENCY OF PIPELINE SPILLS
FOR THE CROSS SOUND ALTERNATE ROUTE SEGMENT

| Approximate Pipeline Miles | Traverse | Length (miles) | Frequency (years) 1/ One Spill Every: | Average Spill Size (bbl) |
|---|---|---|---|---|
| 25 - 38 2/ | Morse Creek to Coastline | 13 | --- | --- |
| 38 - 55 | Eastern Strait of Juan de Fuca | 17 | 69.93 | 115 |
| 55 - 70 | Whidbey Island | 15 | 30.30 | 622 |
| 70 - 73 | Saratoga Passage | 3 | 400 00 | 115 |
| 73 - 76 | Camano Island | 3 | 151.52 | 622 |

Source: TMC 1979

1/ Rates: Land Spill Rates = 0.0022 spills/mile/year
Submarine Spill Rates = 0.00084 spills/mile/year.

2/ Spill risk for this initial sector of the alternative route is covered in chapter 8.

Simulated oil spill trajectories from hypothetical underwater pipeline ruptures in March and September are shown in the Map Addendum. Since little is known about estuarine flow in the Central Basin of the Strait, only tidal currents and wind stress were used in the simulation model. Initial impact zones (first landfall of oil) for spring and fall submarine pipeline oil spills are given in table 9.7-8.

No trajectories for underwater pipeline ruptures between Strawberry Point and Brown Point are available.

TABLE 9.7-8 MOST LIKELY REGION OF FIRST OIL IMPACT
FROM A SUBMARINE PIPELINE SPILL

| Spill Site | | | |
|---|---|---|---|
| March Conditions | Nautical Miles of Shoreline | September Conditons | Nautical Miles of Shoreline |
| Deadman Bay to Eagle Point | 6.5 | Deadman Bay to Eagle Point | 6.5 |
| Iceberg Point to Watmuugh Head | 4.0 | Iceberg Point to Watmough Head | 4.0 |
| Rocky Point to Port Wilson | 9.5 | Rocky Point to Port Wilson | 9.5 |
| Discovery Bay | 17.0 | Protection Island | 3.5 |
| Protection Island | 3.5 | Smith Island | 1.0 |
| Smith Island | 1. | Minor Island | 6.0 |
| Minor Island | | Point Portridge to Admirality Head | 6.0 |

Source: Stewart 1978; Oceanographic Institute of Washington 1979b

### Biological Components

Marine resources in and around the central basin of the Strait of Juan de Fuca are salmon and bottom fish species which are sought by commercial and sports fishermen. These resources are probably the most utilized in the area. Other marine resources are:

1. Pacific oysters in Dungeness Bay, Sequim Bay, and Whidbey Basin subtidal hardshell clams northwest and east of Dungeness Spit, in Sequim and Discovery Bay, off Green Point, around Protection Island, of the western coastline of Whidbey Island, and in Admiralty Inlet; intertidal hardshell clams in Dungeness Bay, Sequim Bay, Discovery Bay, Admiralty Inlet, San Juan Archipelago, and Whidbey Basin; Dungeness crabs in Dungeness Bay, Admiralty Inlet, San Juan Archipelago, and Whidbey Basin; shrimp in the San Juan Archipelago, and Whidbey Basin; scallops in Admiralty Inlet.

2. Surf smelt spawning areas in Dungeness Bay, Sequim Bay, Discovery Bay, Admiralty Inlet, and Whidbey Basin; herring fishing and spawning areas in Dungeness Bay, Sequim Bay, Discovery Bay, Admiralty Inlet, Whidbey Basin, and San Juan Archipelago.

3. Major waterfowl breeding, roosting and/or feeding areas on Dungeness Spit, in Dungeness Bay, Sequim Bay,Discovery Bay, Admiralty Inlet, on Protection Island and Smith Island, Whidbey Basin, and in the San Juan Archipelago.

4. River otter habitats in Dungeness Bay, Admiralty Inlet, and in the San Juan Archipelago; harbor seal haul out and/or pupping areas in Dungeness Bay, on Protection Island and on Smith Island; elephant seal haul out and/or pupping areas on Dungeness Spit, in Sequim Bay, Discovery Bay, on Protection Island and Smith Island, Admiralty Inlet, and in Whidbey Basin; harbor porpoise forage areas off Dungeness Spit, and throughout the San Juan Archipelago; Dall porpoise forage areas in the San Juan Archipelago, in Admiralty Inlet, off Dungeness Spit, and Protection Island; minke whale forage areas throughout the San Juan Archipelago, Whidbey Basin, and central basin of the Strait of Juan de Fuca; and gray whale forage areas off Green Point and Dungeness Spit, in Admiralty Inlet, and in the central basin of the Strait.

The general distribution of these marine resources and mammal sightings are shown on the marine resource maps in the Map Addendum. Marine habitats, including sensitive habitats such as kelp beds, eelgrass beds, and saltmarsh in the vicinity of the TMC alternate submarine pipeline route are indicated on the marine resources maps in the Map Addendum.

Construction of the submarine pipeline between the vicinity of Port Williams to Point Partridge would degrade water quality in the eastern strait, Dungeness Bay, Sequim Bay, Discovery Bay, and Admiralty Inlet. This degradation would be a result of increased suspended solids which would cause turbid water conditions, increased surface temperatures, decreased dissolved oxygen. Also soluble and particulate adsorbed heavy trace metals, nutrients, chlorinated hydrocarbons, and organic debris could be introduced to the water column. These sediment components would further degrade water quality in Skagit Bay and Saratoga Passage and would be particularly severe because of the restricted flow and slow flushing in the Whidbey Basin.

Subtidal clam beds off Port Williams and around Protection Island would be partially destroyed. Repopulation in the destroyed beds on the pipeline transit should occur with 1 year to 18 months and reproducing adult clams should be present in 3 to 4 years. During construction those clams not destroyed could aquire excess burdens of heavy trace metals and chlorinated hydrocarbons. However, after construction is completed, the excess heavy trace metals and chlorinated hydrocarbons would be slowly eliminated.

Waterfowl off Port Williams, around Protection Island in Saratoga Passage, and in Skagit Bay would be disturbed by construction activity and would avoid these areas. Any displacement of waterfowl would be local and temporary.

Harbor seals on Protection Island and Smith Island could be harassed by construction activities which could result in a significant impact if the cows are nursing. The pups could be abandoned and die from starvation or predation.

A submarine pipeline rupture would significantly degrade water quality throughout the eastern part of the Strait, Dungeness Spit and Bay, Sequim Bay, Discovery Bay, San Juan Archipelago, and Admiralty Inlet. Resources impacted would be subtidal clams, marine waterfowl, and marine mammals. Commercial and sports salmon and bottom fisheries would also be significantly impacted.

Waterfowl would suffer high mortality, particularly in Dungeness Bay, on Protection Island and Smith Island. During breeding season low egg hatchability would be expected. Oil trajectories for a pipeline rupture are shown in Map Addendum.

No information is available on oil spill trajectories for the Whidbey Island-Camano Island leg of the submarine pipeline. However, a pipeline rupture would significantly impact shrimp and crab species, sports and commercial salmon fisheries. High mortality of waterfowl in the Skagit saltmarsh and in Saratoga Passage would be expected. Also low waterfowl egg hatchability would occur. The saltmarshes and mud flats in the Whidbey Basin could retain spilled oil for several years.

Fishes, porpoises, and whales would probably avoid oil contaminated areas. Fish could, however, could become tainted from petroleum components by feeding on lower marine organisms. Salmon would be indirectly impacted by loss of a year-class of herring which could occur 2 or 3 years after high mortality in herring roe. "

## Terrestrial Vegetation

This alternate route segment is 52 miles long and traverses marine water, agricultural land, and forest lands. It lies entirely within the Puget Sound Forest Area. The forested areas are almost entirely second growth woodlots of Douglas-fir.

A construction corridor 90 feet wide would be required, committing 153 acres of forest and 185 acres of farmland to pipeline corridor for the life of the project.

Areas of special concern along this segment which could be irreparably impacted include Gray's Marsh (just north of Sequim) and the Skagit River delta and salt marsh. These areas are particularily sensitive to construction and oil spill damage because of the wide variety of animal and plant life which inhabit the marshes.

No plants which have been proposed for federal status as threatened or endangered species are known to occur along the route. No search was conducted to determine whether any species may be affected locally, but since they are generally only rare within the state, their overall distribution would not be seriously impacted.

## Terrestrial Wildlife

The alternate route segment crosses prime habitat for shorebirds and water-oriented birds. Upland areas of the corridor are composed of approximately equivalent amounts of forest and agricultural habitats. Associated species would be similar to those of the prime route. A rating of habitat quality and wildlife potential was conducted at 10 evaluation points along the route (table 9.7-9).

The alternate route would traverse good quality game lands with higher pheasant, waterfowl, and deer populations. Whidbey Island and a very small part of Camano Island have an abundance of deer and a medium to high pheasant and waterfowl density.

Important wildlife areas in the vicinity of the alternate corridor segment include: Dungeness National Wildlife Refuge, Partridge Point, and Penn Cove, which provide habitat for large numbers of birds, especially migrating and wintering waterfowl; Jamestown Beach and Protection Island, which provide a major nesting area for cormorants, pigeon guillemots, rhinoceros auklets, and tufted puffins; and the tidal flats of Skagit Bay near Utsalady, which contains valuable habitat for waterfowl, bald eagles, furbearers, and other wildlife.

Impacts on wildlife (habitat loss and alteration, displacement of wildlife, increased stress, and associated changes in species composition) and the effects of an oil spill would be comparable to those for the proposed route. Similar terrestrial birds and mammals, including upland game species, would be impacted. Less forest habitat, however, would be affected on the alternate route.

Wintering and resident bald eagles (threatened status) have been observed at Green Point and the Morse Creek area. Areas near Utsalady on Camano Island and north of Oak Harbor on Whidby Island are noted as northern bald eagle habitat (Washington Department of Ecology 1979). No impacts on these species are expected.

TABLE 9.7-9 SUMMARY OF WILDLIFE INFORMATION AT EVALUATION POINTS ALONG THE ALTERNATE ROUTE

| Species | Dungeness Area | | | Whidbey Island | | | Camano Island | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A/F 1/ (30)2/ | A (34) | A/F/R (38) | R/F (62) | A (64) | A/R (66) | P/R (68) | R/F (74) | R (78) | A (80) |
| Cover | | | | | | | | | | |
| Tree | H 3/ | L | H | L | L | L | M | M | H | L |
| Shrub | L | L | H | H | L | L | L | M | L | L |
| Ground | M | H | H | L | H | H | H | L | L | H |
| Erosion Potential | L | L | M | M | L | L | L | M | M | L |
| Browse Availability | H | L | M | M | L | L | M | M | H | L |
| Nest Cavities | M | L | M | L | L | L | M | M | H | L |
| Den Sites | M | L | L | L | M | L | M | M | M | L |
| Open Water Availability | H | M | L | M | M | M | M | M | H | M |
| Wildlife Potential | | | | | | | | | | |
| Small Mammals | H | M | M | M | M | M | M | M | M | M |
| Furbearers | L | L | L | M | M | M | M | M | M | M |
| Big Game | L | L | L | M | M | M | L | M | M | L |
| Song Birds | H | M | M | M | M | M | M | M | M | M |
| Waterfowl | L | L | L | M | M | L | L | L | M | M |
| Gallinaceous Birds | M | L | L | M | M | L | L | L | M | L |
| Raptors | M | M | M | M | M | M | M | L | M | L |
| Herpetofauna | M | L | L | M | M | M | L | M | M | M |
| Wildlife Habitat Quality | M | M | L | M | M | L | M | M | M | M |

1/ A - Agriculture
F - Forest
P - Powerline
R - Residential

2/ Approximate distance from Low Point in miles.

3/ H - High Occurrence
M - Moderate Occurrence
L - Low Occurrence

Cultural Resources

The Olympic Peninsula portion of the alternate route segment crosses the Dungeness Valley and the Dungeness River which has been and still is important Indian fishing locality. European settlers farmed the flat portions of the valley such as Sequim prairie. Port Williams is one of the early coastal settlements in this region. The entire coastal margin of Whidbey Island was once intensely used by native occupants who exploited the nearshore shellfish resources.

The cultural resource sites along this route segment alternative are listed in table 9.7-10. Potential impacts to these sites and to any presently unrecorded sites would be the same as identified for the proposed route. There is potential for discovery of additional archaeological and historic sites along the proposed corridor, especially at shoreline areas at the crossings of the Dungeness River, the Strait of Juan de Fuca, and Saratoga Passage.

The proposed action may result in potential impacts to presently unknown cultural resources lying within the project area. Both the ethnographic and archaeological records indicate that the region's aboriginal populations used the area extensively for several millenia. However, on-site archaeological reconnaissance activities have focused on only a small portion of this area. In the absence of direct on-site inspection, it is not possible to conclude that no further significant cultural resources occur within the right-of-way of this alternative.

TABLE 9.7-10 ARCHAEOLOGICAL AND HISTORICAL SITES

| County | Site Name | Site Type | Approximate Route Segment Pipeline Mile |
|---|---|---|---|
| Clallam | McCleary School House | Historic | 8 |
| Clallam | Sequim View Cemetery | Historic | 11 |
| Clallam | Port Williams | Historic port site | 14 |
| Island | Central Whidbey Island Historic District 1/ | Historic land claims and structures | 31-33 |
| Island | Fort Nugent blockhouse site (45IS93) | Historic military installations | 33 |
| Island | 45IS40 | Prehistoric campsite and shell midden | 45 |
| Island | 45IS83 | Prehistoric shell midden and burial site | 48 |
| Island | Utsalady mill site | Historic mill | 48 |
| Island | Camano Island Pioneer Cemetary | Historic cemetary | 49 |
| Island | 45IS83B | Prehistoric shell midden and burial site | 50 |
| Island | 45IS12 | Prehistoric burials | 52 |

1/ The Central Whidbey Island Historic District has been designated the Ebey's Landing National Historic Reserve.

Visual Resources

Areas of potential public exposure to views of the pipeline right-of-way include highway and railroad crossings, residential, and recreation areas. The route would cross two highways, Highway 101 on the Olympic Peninsula and Highway 20 on Whidbey Island, and the Chicago, Milwaukee, and Pacific Railroad on the Olympic Peninsula. The alternative also crosses numerous local arterial and collector streets. On-shore and marine construction activities would be visible offshore from boats in the eastern Strait of Juan de Fuca, Saratoga Passage, and from points along the shorelines. High visual impact is anticipated during the construction phase persisting as low to none for the life of the project.

Extensive shoreline modifications North of Port Williams and on the west bluff (near Partridge Point) of Whidbey Island, plus the Saratoga Passage bluff cuts, are in foreground visual zones of vessels in Puget Sound and Saratoga Passage. The large bluff scars would irreversibly alter the landscape to such an extent that they would be visual intrusions indefinitely.

They would exceed maximum allowable contrast for visual management quality objectives for Class II, and are judged to be critically severe adverse visual impacts.

Construction activities through outlying residential areas near Oak Harbor would result in short term high visual impacts. During the operation phase visual impacts would probably decrease and be moderate to low.

Land Use

The alternate pipeline corridor would traverse parts of Clallam, Jefferson, and Island Counties. The portion within Jefferson County is entirely submarine pipeline and is not evaluated in this section.

The route predominantly crosses agricultural, pasture, and forest land. Urban fringe and residential areas account for less than 1 percent of the route. The remainder of the route traverses salt water, small amounts of fresh water, and wetlands.

Construction would cause short-term temporary impacts on agricultural land and nuisance-related impacts in urban and built-up areas (see table 9.7-11). The types of impacts on land use caused by pipeline construction and operation are described in Chapter 8.

Zoning and Comprehensive Plans

Interim zoning maps show that most of the alternate route within Clallam County passes through agricultural districts. The "Clallam County Shoreline Master Development Program" (Clallam County Shoreline Advisory Committee 1976), indicates that this route segment crosses three designated rural shoreline environments; McDonald Creek, the Dungeness River, and the Strait of Juan de Fuca.

The Interim Zoning Ordinance of Island County, Washington (1966) as amended, indicates the alternate route segment passes through rural and residential zoning districts. The Island County Comprehensive Plan, Planning Policy--Phase Two (1977) indicates that the right-of-way passes through areas designated for several land uses, with rural and agricultural uses predominating (NTPC 1978). According to the Island County Shoreline Management Master Program (1975) the pipeline route crosses four designated shoreline areas: Strait of Juan de Fuca-conservancy, Saratoga Passage-conservancy, Skagit Bay-shoreline residential, and Davis Slough-rural (NTPC 1978).

Transportation and Utility Networks

Submarine pipeline lay barges and associated marine traffic may cause temporary interference with existing marine traffic during burial of the pipeline. However, this represents a minor impact since there would be a large area of navigable water for vessels to maneuver around the construction area. The Saratoga Passage crossing should not present a significant hazard to marine vessel traffic or other submarine cables.

The terrestrial portion of the route would parallel existing corridors/rights-of-way for a considerable distance on Whidbey and Camano Islands. Two highway crossings would be required. The alternate segment crosses a Clallam County Public Utility District 69 kV transmission line in two places (pipeline miles 26 and 34). Possible impacts to other transportation and utility systems would be essentially similar to the proposed route described in chapter 8.

TABLE 9.7-11 CITIES, TOWNS, AND RURAL CENTERS ALONG THE ACROSS SOUND ALTERNATE ROUTE SEGMENT

| County | Name | Population | Distance from Pipeline Route Centerline | Approximate Pipeline Mile |
|---|---|---|---|---|
| Clallam | Agnew | NA 1/ | 0.1N | 30 |
| | Carlsborg | NA 1/ | 1.0S | 34 |
| | Sequim | NA 1/ | 1.5S | 37 |
| Island | Oak Harbor | 11,618 | 1.1S | 63 |

Sources: Washington Office of Financial Management, Population Trends 1977; U.S. Department of Commerce, Bureau of the Census 1977.

1/ Less than 2,500 inhabitants.

Since the same number of pump stations would be required in Clallam County (two), the impact on Clallam County PUD power supply would be essentially the same as that described for the proposed rout in chapter 8.

Recreation

Sport fishing and pleasure boating are important recreational activities on the Strait of Juan de Fuca. Fin and shellfish recreational fisheries, boating, and nearby beaches or day-use areas would be contaminated by oil spills or pipeline leaks. A rupture which would foul shellfish beds in the Dungeness National Wildlife

Refuge would be considered a critical impact. Shellfish bed re-establishment would take a minimum of four years. Over 100,000 recreational visits occurred in 1978.

Loss of recreation resources in the area could occur in oil-fouled areas during the period of containment and cleanup, and for an additional unknown amount of time needed for the reestablishment of pre-spill conditions.

Recreational use of area states shoreline parks was more than four million visits in 1978. Fouling of the Skagit Wildlife Recreation Area would be considered critical to the wildlife and indirectly to consumptive and nonconsumptive recreational uses.

## Social and Economic Conditions

### Population

The three counties along the alternate segment had a 1975 population of 84,800 persons and are projected to have a population of 100,800 persons in 1980. Their projected average annual growth rate until the year 2005 is 2.0 percent. Island County, with the smallest land area, has the second largest population and is the fastest growing of these three counties (estimated 6.6 percent between 1975 and 1980).

The work force required for construction and operation of the alternate pipeline segment would be essentially the same as that required for the proposed route. Clallam County could experience a maximum influx of 982 nonlocal construction-associated people (including the construction force needed for the port). Island and Jefferson Counties could have a similar transient population influx of 811 construction-related persons. This impact would be of a temporary, short-term nature.

Potential impacts on population, housing, and community services would be greatest during the summer tourist season. Community facilities and services in Island County might be strained.

### Housing

During peak construction periods (approximately 1.5 months) Clallam, Island, and, to a lesser extent, Jefferson Counties would experience pressure on available housing. During the summer tourist season, availability of rental units could be strained, particularly in Oak Harbor on Whidbey Island. Impacts on housing during the operational phase should not be significant.

### Community Services

The impacts on community services (e.g. schools, fire and police protection, and medical services) would be similar to those described for the proposed route.

### Employment

Employment generated by the alternative in Clallam and Island Counties would be similar to the proposed route; however, less employment would be generated in Jefferson County.

### Taxes

During the construction period, tax revenues would accrue to state and local governments through the imposition of three major taxes: the leasehold excise tax, the sales tax, and the ad valorem property tax.

During construction of the submarine pipeline, payment of an annual leasehold excise tax would be made on all leases of public property (approximately 20 miles beneath the Strait of Juan de Fuca and Saratoga Passage). Estimates of probable revenue to be generated by the alternative route segment would not be available until a contract rent is established for leasing of the submarine pipeline route.

Sales tax revenues were based on construction costs and apportioned according to the length of pipeline and pump stations located within each county. Total sales tax revenues generated by the alternate segment would be $2,135,100; county revenues would be $209,400; and state revenues would be $1,925,700.

The submarine segments of the pipeline would not be subject to property tax (ad valorem).

## AROUND PUGET SOUND

A route around Puget Sound could be considered an alternative for the proposed TMC route across Puget Sound joining the proposed route near Stanwood, Washington. This alternative route would have a total mileage of 225 compared to 38 for the proposed route. Although this alternative may have more environmental disadvantages than the Cross Puget Sound proposal, future decisions by the State of Washington may eliminate considerations of any pipeline route across Puget Sound. Therefore, this possible legal constraint warrants consideration of an Around Puget Sound Alternative for the proposed pipeline system.

The Around Puget Sound Alternative for TMC would leave the proposed route at pipeline mile 47, near Fairmont, Washington and continue around Puget Sound to North Bend, Washington. This section was described in Chapter 9 for the Around Puget Sound Alternative considered for the NTPC System.

The route would then continue north to Stanwood, Washington rejoining the TMC proposed route at pipeline mile 85. This section was described for the NTPC System (between NTPC proposed pipeline mile 54 and 128) in Chapter 1.

The TMC Around Puget Sound Alternative would potentally have more environmental impacts than the proposed route across Puget Sound due primarily to the greater distance, 187 miles.

Construction impacts on air, land, and water resources would be greater. Operational impacts for oil spill risk would be greater due to the additional 187 pipeline miles. Overall environmental impacts would therefore be far greater for the Around Puget Sound Alternative.

Detailed environmental impacts for the Around Puget Sound segment from Green Point to North Bend were presented in chapter 9 for the NTPC System. From North Bend to

North Bend to Stanwood, environmental impacts were discussed in Chapter 3 under the NTPC System for pipeline miles 54 to 128. For comparison of the alternative impacts to the TMC proposed route, refer to the TMC analysis presented in Chapter 8 for proposed pipeline mile 47 to 85.

## 9.8 Other Crude Oil Transportation Systems

### LONG BEACH, CALIFORNIA, TO MIDLAND, TEXAS, AND MIDWEST (SOHIO)

SOHIO Transportation Company of California is sponsoring a combination of existing natural gas pipeline conversion and new pipeline construction from a new tanker terminal at Long Beach, California, to Midland, Texas, (1,027 miles) as shown in figure 9.8-1. The system includes reversal and conversion of 790 miles of existing 26- and 30-inch natural gas pipeline, and construction of 34 miles of new 30-inch pipeline, 194 miles of new 42-inch pipeline, and 9 miles of new 48-inch pipeline. Oil would travel 2,046 miles by tanker from Valdez to Long Beach, then through 790 miles of converted existing pipeline and 237 miles of new pipeline to Midland, Texas. Initial operational capacity would be 600,000 barrels per day, with eventual capacity of 1 million barrels per day. Sponsors predict that initial phase operation could begin 18 months after permits were issued. Estimated construction cost is $472 million. The Department of the Interior has approved the permit for crossing Federal lands. SOHIO was seeking approval for state permits when, on March 13,1979, the company announced abandonment of the project primarily due to economics and a decreased West Coast oil surplus. On June 20, 1979 SOHIO withdrew the right-of-way application filed under Title I, Mineral Leasing Act, with the Bureau of Land Management Department of the Interior.

The description and environmental analysis of the SOHIO port and pipeline system was presented in the Final Environmental Statement prepared by the BLM, U.S. Department of the Interior, in 1977.

### TRANS-MEXICO PIPELINE

Barber Oil Company proposed the Trans Mexico Pipeline (DOE Hearings July 1978) to transport Alaskan crude oil to U.S. Gulf or East Coast ports via a pipeline across the Isthmus of Mexico. The Alaska crude oil would be shipped by tanker from Valdez, Alaska to Salina Cruz, Mexico, off-loaded at the terminal, transported by pipeline across Mexico to Coatzacoalcos and then loaded on tankers bound for U.S. ports on the coast of the Gulf of Mexico and the eastern seaboard (figure 9.8-1).

The company proposes to construct a terminal at Salina Cruz, Mexico, that would have a total capacity of 1,750,000 barrels per day. The storage facility would have 30 days of storage, or 52.5 million barrels of oil.

The Pacific Ocean terminal would have one single point mooring, located 20 miles offshore and capable of off-loading one 400,000 dead weight ton tanker. The Gulf Coast side terminal would have 7 or 8 single point moorings located 4 miles offshore and capable of loading tankers in the 60,000 to 80,000 dead weight ton class.

A 36-inch to 48-inch pipeline with a design throughput of 1,750,000 barrels per day would be constructed across the Isthmus of Mexico for a distance of 165 miles. Another terminal and tank farm constructed at the pipeline terminus in Coatzacoalcos would also have 30 days' storage capacity.

A pump station would be located at the Pacific Ocean terminal and also at the Gulf of Mexico side. Three more pump stations would be located on the pipeline. All pump stations would be operated by diesel fuel which would be trucked to the sites.

Estimated construction cost is $700 million. Overall transportation costs from Valdez, via the Trans-Mexico pipeline to Houston, Texas was estimated at $1.65 per barrel of crude oil. The present status of this proposal is considered to be in the formative stages pending a more detailed feasibility study. The Mexican Government has been contacted but has not made any committment to approval of the project. However, Mexico would require 60 percent ownership of the project, which would eliminate United States control.

The marine environment on the pacific coast would be affected by the construction of a single point mooring and 20 miles of submarine pipeline to shore near Salina Cruz. Construction impacts would be short term. Chronic oil spills or leaks or ruptures of the line during operation could have long-term effects on marine resources.

Storage terminals for 52.5 million barrels at each end of the pipeline and five pump stations would change the use of an unspecified amount of terrain.

The 165 mile pipeline would pass between two mountain ranges, the Sierra Madre del Sur and the Sierra Madre, and would probably not have to rise more than 600 feet above sea level except for one short stretch that might go to 1,000 feet. Details of the route are not known but hazards and impact of mountainous terrain would be minimized.

Construction of seven or eight single point moorings, 4 miles offshore in the Gulf of Mexico and their connecting lines would have short-term impacts on the marine resources of that sea. Under operation chronic oil spills could have a long-term degrading affect on water quality and productivity. Pipeline leaks or ruptures could seriously impact this part of the Gulf. Under operation chronic oil spills could have a long-term degrading effect on water quality and productivity. Pipeline leaks or ruptures could seriously impact this part of the Gulf.

Lack of data precludes a detailed analysis of the environmental impacts of this proposal. EO 12114 did not extend NEPA's application for actions solely within a foreign country. The order does not affect NEPA requirements for proposals or portions of proposals within the United States. Thus, this proposal within Mexico has not been given an in-depth analysis. However, it has been briefly described to give the reader a full view of the alternative.

## TRANS-GUATEMALA PIPELINE (CAPICO)

Plans for the Trans-Guatemala pipeline proposed by the Central American Pipeline Company (CAPICO) were originally formed in 1974. CAPICO, is a Guernsey, Channel Islands, Corporation, which in turn owns 55 percent of the common stock of a Guatemalan Corporation, Intermares S.A. The remaining 45 percent of this company will be owned by Guatemalan interests, including possibly the Guatemalan government. CAPICO statements indicate that it has already been agreed in principle with the Guatemalan government that Intermares S.A. will have tax-free status and that the ports and pipeline corridor will be granted the status of an international free port. CAPICO also indicates that it has formed the Pacific and Atlantic Shipping Company with the express purpose of providing, together with the Intermares pipeline, an integrated service for Alaskan oil from Valdez to U. S. Gulf and East Coast markets (DOE 1979).

CAPICO has proposed a 42-inch, 227-mile pipeline from a new tanker terminal (up to 200,000 dead weight ton) at Buena Vista, Guatemala, to a new tanker terminal (up to 100,000 dead weight ton) at Puerto Barrios, Guatemala, where crude would be loaded into tankers for transshipment to Gulf Coast ports (figure 9.8-1). Oil would travel by tanker 4,125 miles from Valdez to Buena Vista, 227 miles through the new pipeline, and 1,067 miles by tanker to the Gulf Coast (Houston) and then utilize the mid-continent pipeline system for distribution to the Northern Tier states. Initial operational capacity would be 600,000 barrels per day with about 2 years construction time. Eventual capacity would reach 1.5 million barrels per day. Estimated construction cost is $600 million.

The pipeline would carry not only Alaska North Slope crude, but also foreign crudes to the United States Gulf Coast and the Caribbean. Jones Act vessels would be required to move Alaskan crude via this pipeline. However, since the export of Alaskan crude oil, is currently not permitted, the project would require a designation of "Fee Port" status. U.S. Federal Government approval is not required for the construction of the project but financing might prove difficult unless firm commitments could be obtained from U.S. companies willing and able to use the line for Alaskan crude oil.

The Trans-Guatemalan Project involves the construction of two fixed berth facilities capable of servicing 200,000 dwt tankers at the unloading port, located at the entry point to the Canal de Chiquimulilla loading port, consisting of four fixed berths, capable of servicing 100,000 dwt tankers is proposed on the Caribbean Coast at Punta de Manibique. Both harbors would be manmade and dredged to 62 and 55 feet, respectively. Both would be furnished with supplementary dry cargo handling piers for construction and logistics purposes.

The system is designed for an initial throughput of 600,000 barrels per day, increasing to 900,000 barrels per day and ultimately to 1,200,000 barrels per day in the following 2 years. Maximum throughput would be 1,500,000 barrels per day after the final incremental investment.

Fixed-berth ports are needed because of the lack of protected waters for SPMs on the Pacific Coast and by the long distance to deep-water suitable for SPM on the Caribbean side. However, fixed berths require significant dredging, estimated at 25 percent of the combined costs of the terminals and storage. The 100,000 dwt tanker limitation on the Caribbean side appears an unnecessary limitation in view of the prospect that superports such as LOOP or Seadock might be built on the U.S. Gulf Coast.

A Pacific tank farm consisting of four tanks with 5 million barrels total capacity would be located about 1 mile from the Pacific port and a six-tank Caribbean tank farm with 7.5-million-barrel capacity would be sited about 1 mile inland from the Caribbean berths. A 250,000-barrel dirty ballast water tank and associated ballast-treating equipment would be located at the Caribbean terminal.

The proposed pipeline route starts at Buena Vista, near the Guatemala-ElSalvador border and ends in the Golfo de Honduras in the Caribbean, a distance of 227 miles (figure 9.8-1). A 42-inch pipeline is proposed, with 70,000 total installed horsepower to transport 1,200,000 barrels per day. There is some indication that by adding more pumping capacity and some looping, the line's throughput could be increased to 1,500,000 barrels per day although no detailed estimates are available regarding this potential expansion. A detailed route for the line has not been

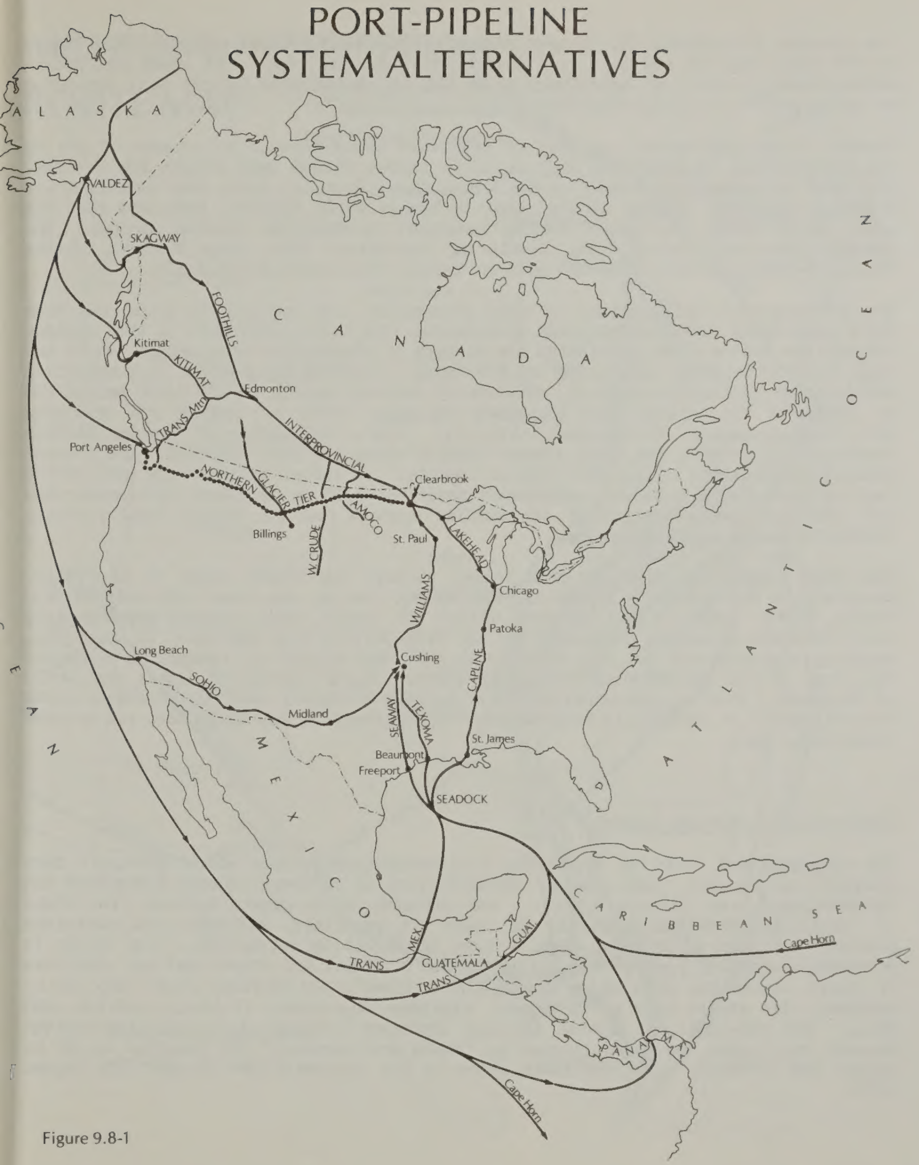

PORT-PIPELINE SYSTEM ALTERNATIVES

Figure 9.8-1

selected, but a preliminary pipeline profile prepared by J. G. Mackin and Associates was used to design the required pumping stations and for estimating pipeline capital and operating costs. It appears that the proposed pipeline route would traverse some rather severe mountainous terrain for the first 85 miles and would then traverse level swampy terrain.

The entire project would take 24 months to complete, once all permits and authorizations are received. The system could be operational at half throughput (600MB/D) 18 months after initial construction work is completed. An early 1979 construction start was planned.

The Trans Guatemala proposal would result in environmental impacts on the marine environment and on the terrestrial environment across Guatemala. The potential for oil spills would exist for the marine sea leg from Valdez, Alaska to the terminal at Buena Vista, and from the Puerto Barrios terminal to the Gulf Coast ports. Construction of the 227-mile pipeline across Guatemala would cause short-term impacts on the terrestrial environment, such as vegetation and soils. The long-term impact would be the 227 miles of new utility corridor incluing 100 miles through mountainous areas and across four major rivers. Additional land would be required for the off-loading terminals and the onshore storage facilities. The potential for oil spills during operation would exist for the entire pipeline and also at the onshore storage facilities.

The potential advatages of this project aree as follows:

Would be the least expensive pipeline alternative for delivering ANS crude from the west to east coasts

Would poses no problem for conventional pipeline construction because the proposed pipeline route extends over relatively flat Guatemalan terrain.

Potential disadvantages of the project are as follows:

Would not be a U.S.-controlled pipeline,

Would have to rely on the midcontinent system to supply crude to the Chicago area,

Would not directly insure distribution of ANS crude to the northern tier states west of Minnesota, or solve predicted petroleum shortfalls in that area

Would require a longer distance for marine transport of ANS crude, increasing environmental hazards and security risks.

Further detailed environmental analysis was not conducted. EO 12114 did not extend NEPA's application extraterritorially for actions solely within a foreign country. The order does not affect NEPA requirements for proposals or portions of proposals within the United States. Thus, this proposal within Guatamala has not been given an in-depth analysis. However, it has been briefly described to give the reader a full view of the alternative.

## PANAMA CANAL AND MID-CONTINENT PIPELINES

Alternate supply sytems for transporting surplus West Coast crude oil could be by tanker around Cape Horn or through the Panama Canal to Gulf Coast ports. Both tanker systems would require utilizing the Mid-Continent Pipelines for distribution to refineries needing the crude oil supply.

### Shipment Around Cape Horn to the Gulf Coast

The largest vessels currently being built in U.S. shipyards are in the range of 200,000 to 390,000 dead weight ton. Assuming that U.S. flag carriers of 220,000 dead weight ton would be utilized in the marine movement from Valdez to the Gulf Coast, no 220,000 to 390,000 dead weight ton tankers exist for the Jones Act fleet.

Use of larger vessels would result in fewer tanker trips and in fewer loading and unloading operations at west coast terminals. To the extent that the possibility of spillage increases with the number of trips involved and that most chronic oil spills are associated with loading and unloading operations, the use of the larger vessels would perhaps give a slightly improved level of safety impact by reducing exposure to such risks. However, the weather and rough water associated with the passage around Cape Horn is substantially more hazardous than the weather conditions which prevail between Alaska and California, and to this extent, environmental debits accrue to the Sea Leg around Cape Horn in terms of risk of major oil spill. Furthermore, no facility currently exists on the Gulf Coast for accommodating vessels of the 220,000 dead weight ton class. One U.S. deepwater port facility project offshore of the Gulf Coast, LOOP, has been approved. While now under construction, the facilities to handle 220,000 dead weight ton tankers might be available by early 1981. At the present time, foreign flag tankers of this size are delivering their oil to Caribbean transshipment terminals such as Freeport at Curacao, West Indies for subsequent transfer to smaller vessels which can be accommodated in U.S. Gulf of Mexico coastal ports. Controlling depths along the Gulf Coast vary from 35 to 45 feet. Transshipment would require double handling of the oil, creating additional opportunities for chronic oil spills with resulting adverse environmental impacts.

The total round-trip distance from Valdez to the Gulf Coast via Cape Horn is approximately 31,000 nautical miles. During such a voyage, a 220,000 dead weight ton (or larger tanker available that could be loaded at Valdez) tanker would consume about 90,000 barrels of bunker fuel, or about 0.065 barrels of bunker fuel per barrel of crude oil delivered.

### Shipment through the Panama Canal to U.S. Gulf of Mexico Coast

The Maritime Administration, in a study commissioned by the Department of Energy, has determined that the existing and anticipated Jones Act fleet would be adequate to handle the full west coast surplus should the Panama Canal route and lightering be used. Lightering would allow 80,000 to 250,000 dead weight ton tankers to be used from Valdez to Panama and off-loaded at the Panama Canal to the 65,000 dead weight ton tankers able to transit the canal and off-load in Gulf Coast ports (SOHIO 1977).

The physical limitations for vessels transiting the Panama Canal are a maximum length of 960 feet, beam of 106 feet, and drafts of 37 to 39.5 feet. The canal can accommodate laden vessels of approximately 65,000 to 89,000 dead weight ton, depending on the vessel's particular dimensions.

Transit of 500,000 barrels per day of crude oil would require an average of one to two Panama Canal transits per day of fully loaded 65,000 dead weight ton vessels. The above information provided by the Panama Canal Company, which also expressed its desire to increase ability of the canal to handle world traffic, indicates that the canal could handle the tanker traffic necessary to move the Alaskan surplus. The company indicated further that lightering operations from large tankers of the Valdez-to-Panama route to tankers able to transit the canal are feasible.

The environmental implications of this alternative are not greatly different from those associated with the Cape Horn alternative. The major difference is that passage through the Panama Canal eliminates the dangers of stormy Cape Horn waters, while the Cape route eliminates lightering at the canal. Lightering results in substantial emissions of hydrocarbon vapors. The use of smaller vessels (65,000 dead weight ton or less) for the entire route increases the total number of loading and unloading operations necessary to transport this oil. Also, utilization of smaller tankers results in increasing the total tanker traffic along the west coast with the corresponding implications of greater risks of spills. If larger vessels were used on the Pacific side of the movement, additional handling would be necessary to transfer the oil from the larger vessels to the smaller vessels for the Panama Canal passage. Chronic spillage would be greater.

The total round-trip distance from Valdez through the Panama Canal to St. James, Louisiana is approximately 17,000 nautical miles. During the round trip portion from Valdez to the Canal, a 165,000 dead weight ton tanker would consume approximately 27,950 barrels of bunker fuel. During the trip portion from the Canal to Louisiana, assuming approximately two and one-half 65,000 dead weight ton tankers to transport the cargo of the 165,000 dead weight ton tanker, 15,840 barrels of bunker fuel would be consumed. This is approximately 0.037 barrels of bunker fuel per barrel of crude oil delivered, or about half that demanded by delivery to the Gulf Coast via a route around Cape Horn.

### Mid-Continent Pipeline System

The Mid-Continent Pipeline System is a network of pipelines which transport both domestic and foreign crude oils to redistribution or refinery centers throughout the Mid-Continent area (figure 9.8-2). The network, which generally runs from south to north, is comprised primarily of crude oil pipelines, although some petroleum product lines are also being used to move crude oil to refineries. The system is presently supplying much of the northern tier's demand for crude, and new pipelines or future expansions of existing Mid-Continent lines could increase crude supplies to northern tier states such as Minnesota, Michigan, Wisconsin, Illinois, Indiana, and Ohio. The Mid-Continent System is also important because crude oils transported through the system can be delivered to Canada and exchanged for Canadian crude to supply the needs of crude deficient areas in the Northern Tier states (DOE August 1978).

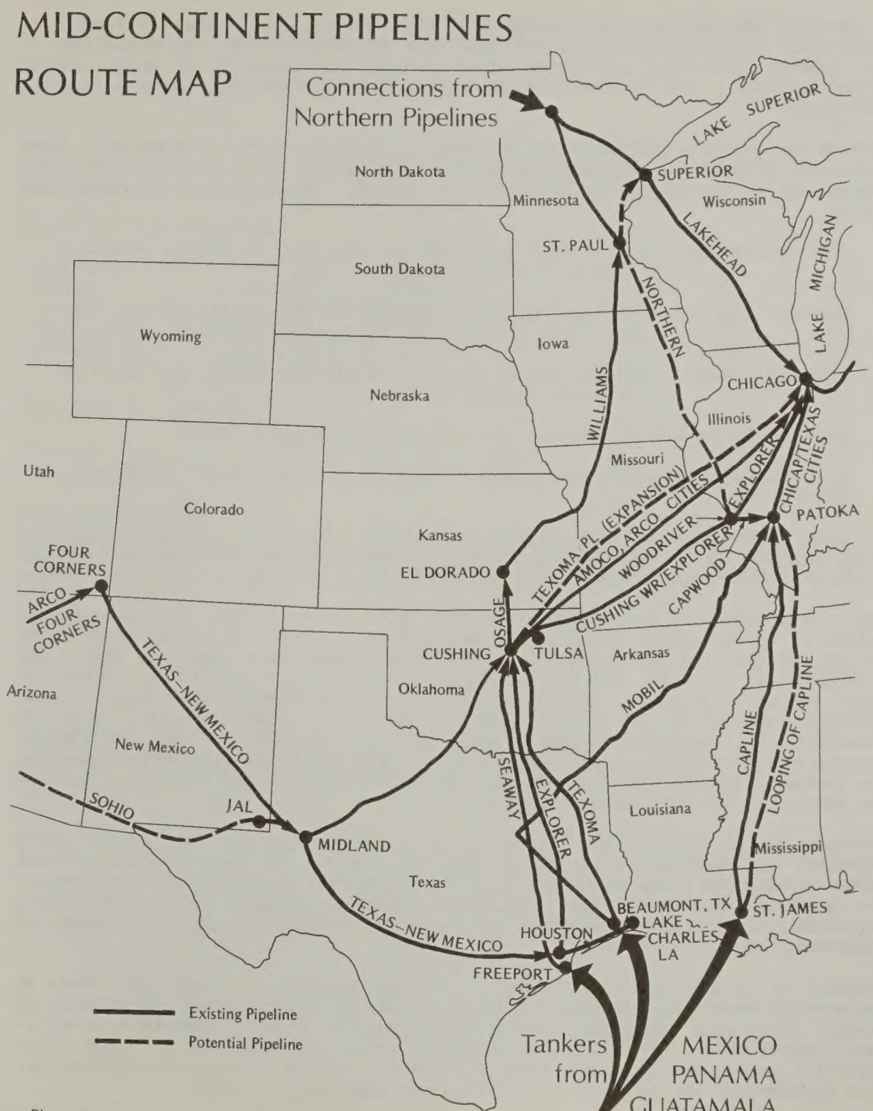


Figure 9.8-2

The existing Mid-Continent Pipeline System is separated into three parts, based on pipeline origins: 1) the Gulf Coast; 2) Patoka, Illinois; 3) and Cushing, Oklahoma. These are the three most critical areas in terms of analyzing crude capacities and identifying system deficiencies.

There are two main pipelines which exit the Patoka, Illinois, area. These are the Chicap and the Texaco Cities lines, both of which are currently operating at capacity.

The Chicap Pipeline is 203 miles of 26-inch line, plus 32 miles of another line, which extends from Patoka, Illinois, to the Chicago area. The 382,000 barrels per day line, now operating at capacity, receives crude from the Mobil and Capline Pipelines, and supplies crude to the Chicago refineries. The Chicap Pipeline expanded capacity to about 490,000 barrels per day, in September 1978.

The Texaco Cities Pipeline is an 18-inch line which extends from Patoka to Chicago. The line has a 153,000 barrels per day capacity and is operating at capacity. Expansion of the system's capacity is constrained by three factors: 1) capacities of installed pumps and pressure limitations, 2) supply constraints of the lack of crude oil from other interconnecting pipelines, and 3) delivery constraints because of upstream pipeline restrictions.

There are four main pipelines which exit Cushing, Oklahoma, for regional demand centers. These are the Arco, Amoco, and Texas Cities Pipelines which extend to Chicago, and the Williams Pipeline which extends to Minneapolis. The following summarizes the crude potential for these systems.

The Amoco Pipeline System is a common carrier serving the Mid-Continent area, which extends from the Rocky Mountains, west Texas, and the Gulf Coast to Kansas City, Chicago, and St. Louis. The main line serving the Mid-Continent area extends from Cushing to Chicago, and is a continuation of an 8-inch; two, 12-inch; and a 20-inch line. The system has a 370,000 barrels per day capacity and is currently operating at about 300,000 barrels per day. Expansions to the system would involve looping which is currently not under consideration.

The Arco Pipeline is a 24- and 22-inch line which extends from Cushing to Key, Missouri, and to Chicago. The line has a 300,000 barrels per day capacity and it has been operating at this level since December 1976. The only expansion possibilities for this line are to loop the line and the economics for such a project are presently uncertain.

The Texaco Cities service crude pipelines interconnect with several lines to transport crude from Cushing, Oklahoma and Patoka, Illinois to the Chicago area. One, 8-inch and two, 12-inch lines run from Cushing to Chicago, and an 18-inch line extends from Patoka to Chicago. The line from Cushing to Chicago has 46,000 barrels per day capacity and the line is operating at that level.

The Williams Pipeline carries refined products from refineries in Oklahoma and Kansas to markets in Nebraska, Iowa, Illinois, Missouri, Indiana, South Dakota, North Dakota, Minnesota, and Wisconsin. The main trunklines run north from Barnsdall, Oklahoma through Kansas City and Des Moines to the Minneapolis-St. Paul area. The Williams Product Pipeline has, since 1974, delivered some crude to the Northern Tier area as spare capacity has become available. Initally, about 20,000 barrels per day of crude oil moved to the Minneapolis area, but recent expansions to the system in

1977 allowed about 80,000 barrels per day of crude to move to the area. A second expansion was completed in August 1978 and is transporting 120,000 barrels per day of crude to move to St. Paul, Minnesota.

Williams Pipeline Company is also considering further expansion to its main line system which could raise the crude oil capacity of 285,000 barrels per day to the Minneapolis area and 70,000 barrels per day to the Wrenshall-Superior area. This expansion would entail 691 miles of 24-inch line from Cushing to Mason City and 163 miles of 12-inch line from Cottage Grove to Wrenshall-Superior, plus pumps and tankage, and cost about $189 million.

There are five major pipeline systems which originate in the Gulf Coast and supply crude to the Mid-Continent area. These are the Explorer, Texoma, Mobil, Seaway, and Capline Pipelines. The following summarizes these systems and their potential for supplying crude to demand centers.

> Explorer Pipeline is a product line which batches crude to the Tulsa and Chicago areas from Lake Charles, Louisiana. The 90,000 barrels per day of crude capacity of system, has been increased to 145,000 barrels per day. The system is being expanded to provide a total of about 335,000 barrels per day to Tulsa and 235,000 B/D to Chicago.
>
> Texoma Pipeline is a 300,000 barrels per day line extending from Beaumont, Texas to Cushing, Oklahoma. The line is presently operating at capacity, but could be expanded to 620,000 barrels per day with increased demand. Presently, Amoco is considering a 200,000 to 600,000 barrels per day extension to the Texoma line from Cushing to Chicago. This extension would necessitate an increase in the Texoma line to its ultimate capacity.
>
> Mobil Pipeline is a 165,000 barrels per day line from Beaumont, Texas to Patoka, Illinois. The line is presently full and there are no plans to expand capacity.
>
> Seaway Pipeline is a 320,000 barrels per day line extending from Freeport, Texas to Cushing, Oklahoma. The system is currently operating at 240,000 barrels per day. Ultimate capacity of the system is 592,000 barrels per day.
>
> Capline Pipeline is a 1,160,000 barrels per day line extending from St.James, Louisiana to Patoka, Illinois. The system is currently operating at capacity and the only means of expansion is to loop the line. This is presently being considered and the segment between St. James to Patoka is concurrent with the first stage operation of the LOOP project which would transport 140,000 barrels per day when completed in 1980.

In summary, the Mid-Continent Pipeline System comprises many major crude oil pipelines. Currently, most existing pipelines are at or near capacity; increases in demand or cutbacks on other crude sources, such as Canadian curtailments, must be offset with increases in existing lines or with new lines. There is very little unused capacity on the existing system. The Seaway Pipeline shows 80,000 barrels per day of excess. There also appears some capacity on the Explorer Pipeline actual throughput volumes are 90,000 barrels per day, but they are expected to reach 145,000 barrels per day. However, crude capacity on the Explorer Pipeline is also dictated by product throughput which has priority over crude.

In general, the Mid-Continent System is full. However, the system is capable of significant expansion. Based on published data or comments from representatives of the various pipelines, the system could increase its capacity by about 875,000 barrels per day. Most of these increases, 530,000 barrels per day, would be from the Gulf Coast.

Several new pipeline proposals are currently in various states of planning. These proposals, if built, would materially affect the supply of crude to the Mid-Continent System and to several of the Northern Tier states. These systems are summarized below:

> Capline Looping---up to 1 million barrels per day from St. James, Louisiana to Patoka, Illinois.
>
> Northern Pipeline---175,000 barrels per day to 240,000 barrels per day from Wood River, Illinois to Minneapolis, Minnesota.
>
> Texoma Extension---200,000 barrels per day to 600,000 barrels per day from Cushing to Chicago, Illinois.
>
> SOHIO---500,000 barrels per day from Long Beach to Midland, Texas.
>
> Four Corners---up to 150,000 barrels per day from Long Beach to Houston, Texas.

As shown, five major new lines are being considered which would materially affect the crude supplies to the Mid-Continent area. A summary of the existing Mid-Continent Pipeline System capacity and potential expansion was presented in table 9.8-1.

There is presently no detailed environmental data concerning these Gulf Port combinations to use in making an environmental analysis. Crude oil is presently being shipped through the Canal, with the aid of a transshipment facility, and a new permanent port facility. All four of the proposals involve a much longer shipment by water therefore present a greater spill risk and fuel cost. The three Central American proposals involve four transfers in port. As a result of these additional transfers a corresponding increase in spill risk could be expected. The construction impacts of either of the two Central American pipelines would also include building new berths on both the Pacific side and the Gulf of Mexico side, submarine pipelines and storage on the West and East Coasts.

Expansion of the Mid-Continent network would require substantial new construction of pipelines and expansion of the port facilities. The new pipeline construction would occur in many populated areas and could be expected to cause moderate disruption. The existing United States port facilities already exceed most Federal air quality standards and additional through-put could be expected to exaggerate the existing situation.

Shipment to the gulf ports and through an expanded Mid-Continent pipeline network to the Northern Tier refineries would require substantial investment and coordination by several independent companies. If, in the judgment of pipeline investors, a sufficient demand exists and a profit could be expected on the operation of such a transportation system, new proposals would be expected. Pending these further proposals, this hypothetical new capacity cannot be further analyzed.

TABLE 9.8-1 SUMMARY OF EXISTING MIDCONTINENT PIPELINE CAPACITIES, THROUGHPUTS, AND POTENTIAL CAPACITIES (MB/D)

|  | From | To | Current Capacity | Current Throughput | Maximum Capacity | Potential Over Current Capacity |
|---|---|---|---|---|---|---|
| Pipelines from Gulf Coast |  |  |  |  |  |  |
| Capline 1/ | St James | Patoka | 1,160 | 1,160 | 1,160 | 0 |
| Texoma | Beaumont | Cushing | 300 | 300 | 620 | 320 |
| Mobil | Beaumont | Patoka | 165 | 165 | 165 | 0 |
| Seaway 1/2/ | Freeport | Cushing | 320 1/ | 240 | 592 | 272 |
| Explorer 1/3/ | Lake Charles | Tulsa | 190 | 145 1/ | 335 | 145 |
|  | Tulsa | Chicago | 145 | 145 1/ | 235 | 90 |
|  |  |  |  |  |  | 527 |
| Pipelines from Patoka |  |  |  |  |  |  |
| Chicap | Patoka | Chicago | 382 | 382 | 490 | 108 |
| Texaco-Cities |  | Chicago | 153 | 153 | 153 | 0 |
|  |  |  |  |  |  | 108 |
| Pipelines from Cushing |  |  |  |  |  |  |
| AMOCO | Cushing | Wood River | 370 | 300 | 300 | 0 |
| ARCO |  | Chicago | 300 | 300 | 300 | 0 |
| Texaco-Cities Service |  |  |  |  |  |  |
| Williams |  | Minneapolis | 120 1/ | 50-70 | 285 | 160 |
|  |  | Wrenshall | --- | --- | 7 | 70 |
|  |  |  |  |  |  | 230 |
|  |  |  |  |  | Total | 865 |

Proposed New/Expanded Systems

Capline looping--up to an additional 1 MMB/D from St. James to Patoka
Northern Pipeline--175MB/D to 240 MB/D from Wood River to Minneapolis
Texoma Extension--200MB/D to 600 MB/D from Cushing to Chicago

Source: Department of Energy 1979

1/ Transshipment of ANS crude from Valdez by 65,000 dwt tanker through the Panama Canal and into gulf ports located in Texas and Louisiana. To accommodate tanker movement, two offshore deepwater crude terminals have been proposed at these ports--the Louisiana Offshore Oil Port (LOOP) would be located 19 miles south of Grand Isle, near St. James, LA., and would send oil through the Capline system, currently operating at full design capacity.

2/ Data effective August 1978.

3/ Data for Explorer is based on crude flows only. These cannot exceed 50 percent of the throughput. Actual capacities are twice values shown.

## NORTHVILLE PANAMA TRANSSHIPMENT

Northville Industries Corporation, Huntington Station, New York, presented a proposal for transshipment of Alaskan crude oil through the Panama Canal to the Gulf Coast. The system moves crude from the Valdez, Alaska pipeline terminus via tanker through a Panama Canal transshipment facility to Gulf and East Coast ports for ultimate distribution by pipeline to Northern Tier states (Northville Industries 1978).

The Panamania Transshipment Port (PTP), currently in operation at Puerto Armuelles, was completed in December 1978 and operational in 1979. The site was selected for its proximity to the Canal, deep water, sheltered harbor, and suitable topography for the combination of docking and terminaling components.

While construction was being completed, oil shipment through the Canal was being accomplished by lightering operations carried out through two supertankers anchored at the Gulf of Parita. This temporary operation effectively transshipped in excess of 400,000 barrels per day.

The PTP terminal receives large oil tankers from Valdez, off-loads to storage tanks and reloads oil onto shuttle tankers transiting the Panama Canal. Transshipments are economically possible because the largest tanker which can transit the Panama Canal is 67,500 dead weight ton. The transshipment facility permits shippers to gain the economies offered by supertanker transport (up to 265,000 dwt) as far as Panama's west coast.

The PTP terminal has an initial throughput capacity of 425,000 barrels per day and storage of 2.5 million barrels in three, 830,000 barrel tanks. Two ship berths were constructed with the following specifications:

|  | Berth One | Berth Two |
|---|---|---|
| Maximum size tanker | 265,000 dwt | 90,000 dwt |
| Minimum size tanker | 30,000 | 30,000 |
| Water depth at berth (mean low water) | 80 feet | 58 feet |
| Maximum off-loading rate | 100,000 BPH | 48,000 BPH |
| Maximum loading rate | 48,000 BPH | 48,000 BPH |

Complete ballast treatment/oil recovery systems are also included in the transshipment complex.

Present crude oil throughput for the facility is not known. The PTP facility could be expanded to accommodate future needs by the addition of necessary storage capacity and two more jetties. Such expansion would provide a throughput capacity of approximately 900,000 barrels per day.

Until the completion of the onshore transshipment terminal, surplus Alaska crude was being transshipped via lightering off the West Coast of Panama. Two, 265,000 dwt vessels owned by British Petroleum were employed as floating storage vessels in the lightering operation.

Industry sources estimate that each vessel was outfitted at a cost of $2 million and costs $30,000 per day to operate. Including positioning expenses and transshipment fees, lightering costs approximately $0.15 per barrel.

Industry sources indicate that lightering between a floating storage vessel and a shuttle cannot be carried out in seas greater than 6 to 8 feet or winds greater than 30 miles per hour. It is reported that these conditions require a shutdown in operations at least 1 day a month, and during harsher weather spells, shutdowns have been considerably longer. Transshipment operations at the onshore terminal would not be subject to such delays.

Operational difficulties impair the effectiveness of a lightering operation. Approximately 4.5 million barrels of dirty ballast discharged by shuttles into the floating storage vessels must be reloaded into vessels returning to Valdez where the ballast is treated. These two ballast transfers result in the loss of up to 3 days per month of docking time. Such an operation is unnecessary at the onshore terminal, which is equipped with ballast treatment facilities. In addition, greater time must be allocated to berthing vessels against the floating storage ships as opposed to permanent jetties situated in a sheltered harbor. Finally, jetty loading arms at the onshore terminal pump at higher rates than those of the floating storage vessel.

Industry sources indicate that at least 1 additional day is required for loading and discharging via lightering as opposed to onshore transshipment. Experience with lightering off the West Coast of Panama confirms this estimate. In the month of June, shuttles and VLCCs averaged 41 to 84 hours, respectively, from time of arrival at the lightering site to time of departure. With operation of the onshore terminal, vessels arriving on schedule are loaded and unloaded within 24 and 30 hours, respectively.

Following shipment to the Gulf Coast Ports, the Alaskan Crude oil would be distributed to some of the Northern Tier states through the Mid-Continent pipeline system. For capacity and distribution, refer to the previous section which describes the Mid-Continent Pipeline System.

## UNIT TRAINS

Unit train transport has been proposed as a short-term alternative to transport the surplus flow of North Slope crude oil and supply the refineries in Montana. The General American Transportation Company (GATX) and the Burlington Railroad proposed the Unit Train System in 1977. The U.S. Army Corps of Engineers, Portland, Oregon District prepared an Environmental Assessment in April,1978 and began preparation of an Environmental Statement. In September, 1978 GATX announced plans for abeyance of the project with the U.S. Army Corps of Engineers. Although the specific project is presently inactive, the Unit Train System will be considered as an alternative.

A unit train consists of about 90 oversize tank cars with a total capacity of 50,000 barrels per train. GATX and the Burlington Northern Railroad, have proposed to use Port Westward, Oregon, an 850-acre U.S. Army fuel depot, as western terminus for unit trains. The port can presently accommodate 30,000 to 35,000 dead weight ton tankers and unloading facilities can transfer about 35,000 barrels of oil per day. Dredging to accommodate larger tankers up to 75,000 dead weight ton and expansions of unloading facilities to transfer up to 48,000 barrels per day is proposed. Approximately two to five tankers would call at the port each month. Burlington Northern proposes to transport the crude oil by train primarily to markets in Montana.

Potential environmental impacts exists from the tanker shipment in the Columbia River, construction and operation of the Port Westward terminal and unit train shipment near sensitive area in Oregon, Washington, Idaho, and Montana. The Oregon Department of Environmental Quality (DEQ) and the U.S. Army Corps of Engineers (COE) have presented preliminary environmental assessments on the GATX proposal.

The tanker shipment of Alaska sour crude oil and some foreign sweet crude oil would increase the oil spill risk in the Columbia River up to Port Westward. The Oregon DEQ Staff Report (November 1977) stated that no significant oil spills would occur from the tank farm and rail car loading pad based upon the technology of oil spill prevention. Oil Spill risk from the tanker and the off-loading at the dock would be regulated by the U.S. Coast Guard and by the Federal SPCC (Spill Prevention Control and Containment) plan. Following review of the GATX application, the Oregon DEQ issued an Air Containment Discharge Permit (No. 05-2569) and a Water Pollution Control Facilities Permit with special conditions attached.

The Port of St. Helens' Draft Public Notice and application for upgrading the docking facilities at Port Westward prompted the U.S. Army Corps of Engineers to prepare a preliminary Environmental Assessment. The COE summarized the environmental impacts as follows:

a. The issuance of the permit would result in an increase in tanker traffic and a substantial increase in the volume of crude oil shipped on the Columbia River. The level predicted would likely increase both the risk of major spill occurring as well as its associated impacts. A detailed risk analysis should be performed to determine the probability of a major spill occurring on the Columbia River, both with and without the GATX terminal.

A sufficiently detailed analysis should be prepared to identify both environmental and socioeconomic impacts of oil spills of different magnitudes at high and low flow periods, during major fish-spawning and migration periods, and during maximum, waterfowl use periods. The assessment should be done, as a minimum, for the area around Port Westward, for the immediate Columbia River Estuary, and for the Columbia River Bar.

b. Transporting crude oil by rail from Port Westward to Pasco, Washington, would also increase the potential for a major oil spill in the river. The risk analysis should include the probability of a spill and potential impacts associated with transporting the oil by rail along the Columbia from Port Westward to Pasco. The risk analysis should address the increased frequency of rail traffic, conditions of the track, and past records of accidents on the line. The impact assessment should include the conditions discussed above, as well as the potential impacts to the fish facilities at the Columbia River Dams downstream from Pasco and should be done for at least four separate upper river areas.

c. Since the impact of a spill also depends upon the effectiveness of the containment and cleanup operations, an assessment should be made of the available methods and equipment for containment and cleanup, as well as their respective effectiveness and availability in the upper and lower Columbia River, the Columbia River Estuary and Bar.

d. The proposal's consistency with the goals and guidelines of the local and State Land-use plans will have to be evaluated, as well as the applicability of the recent amendments to the Marine Mammal Protection Act.

e. The project may create a significant noise impact at the terminal and along the spur line. This should be assessed by determining the increase in noise above the ambient levels for noise-sensitive areas (residential areas, hospitals, schools, rest homes, etc.) along the spur line and near the terminal.

f. Though it would appear that the project will have little socioeconomic impact to the local or regional area, assessment would be necessary to confirm this. The assessment should include the potential impacts of using the facility for storage and transfer of locally used petroleum products.

g. An assessment of alternatives would be required in order to determine if the proposed action is the most desirable from an economic, environmental, and public interest standpoint.

## 9.9 Other Alternatives

A number of other alternatives have been considered by the Environmental Statement team and were raised by the public during the comment period. They include such alternatives as the following: Conservation, exchanges with Japan or Canada, retrofitting refineries, reducing Alaskan production, redistribution or, reallocation of domestic supplies, and arctic seatrains. Detailed environmental impact analysis for each of these alternatives would be inappropriate in the absence of specific proposals which would be subject to such an analysis. For example, conservation is a most important national goal, but it is a goal that is vague, has almost unlimited methods of being accomplished, and is nationwide in scope. To attempt to consider in detail the environmental impacts nationwide of an almost infinite number of combinations to reach an undefined goal has not been attempted. Another example: A swap of Alaskan oil, With whom? From what part of the world would the oil be shipped to replace the Alaskan oil sold to Japan? Again, it is believed not only unnecessary, but also impossible within the context of this ES to consider world-wide shipping of oil. When any of these currently broad concepts are reduced to specific proposals, they would, at that time, be subject to the provisions of NEPA.

Each of these altenatives have been outlined in the following discussion to present a general discusion of each to the public and the decisionmaker.

There are several alternatives not requiring a new west to east pipeline that would reduce or negate the need of the proposed projects. Although, individually they don't accomplish the purpose of the proposed projects, arranged in different combinations and proportions they could provide an almost unlimited number of actions that together would accomplish much of the same purpose. These can be discussed in three major categories: Those that reduce the surplus on the west coast, those that would supply crude oil to the northern tier states, and those that would reduce the projected demand for crude oil in the northern tier states.

### Reduce West Coast Surplus

Of the 1.2 million bpd that was being delivered by Trans Alaskan Pipeline (TAPS) in May 1979, 440,000 bpd was surplus to the demand on the west coast and was shipped to the Gulf Coast. 400,000 bpd a day was shipped through the Panama Canal and 40,000 bpd was shipped around Cape Horn. The TAPS line is scheduled to be increased to 1.35 million bpd in January 1980 and has an ultimate capacity with additional pump stations of two million bpd.

It should be understood that the surplus of heavy crude on the west coast is only surplus or in excess of the refinery preference for the type of crude they wish to process. This preference is determined by the design of the refinery and the demand for the mix of refined products in the area, the lighter the crude oil the higher the yield of gasoline. Because of this refinery preference large amounts of light foreign crude are imported into the west coast.

Retrofitting of existing refineries to process heavier crudes or the construction of new refineries is an extremely expensive undertaking, but conversions could be done and this is an action that would reduce the excess of heavy crudes on the west coast. Conversion could be voluntary or there could be some form of governmental stimulation. Voluntary conversion would be expected to occur when economic factors would favor such an action, such as ANS crude being priced to make it attractive in relation to foreign crude, or if foreign crude was not available. Governmental action, could stimulate conversion by methods such as tax credits, loan subsidies similar to the present Entitlements Program, or by placing a duty on foreign crude.

Exchange of ANS for foreign crude that could be delivered to U.S. ports more economically has been proposed by the state of Alaska and others. This is prohibited by the Alaska Pipeline Act (Public Law 93-153) unless the President determines that it will not diminish the quantity or quality of the petroleum available to the U.S. and is otherwise in the national interest. The President's decision to approve an export after making these determinations is subject to veto by Congress within 60 days after his decision. The state of Alaska proposal would involve the exchange of ANS crude with Mexico. The ANS crude would be shipped to Japan and the Mexican crude would be delivered to Gulf Coast ports. The shipping cost would be reduced because of the short distance from the west coast of Mexico to the Gulf ports and the economy of using large tankers for shipment from Valdez to Japan.

Any action that reduces the transportation costs on ANS crude, such as full utilization on the west coast or foreign exchange, would increase the profits to the owners of the oil and also the royalties to the state of Alaska. This could increase the incentive to the oil companies for further exploration and production in Alaska and could serve to reduce the U.S. dependence on foreign crude.

One method of eliminating the west coast surplus would be to reduce the production of ANS crude to the level of west coast demand. While this reduces the transportation costs and provides the lowest cost storage it would increase the U.S. dependence on foreign crude, adversely affect the balance of payments, reduce income to the state of Alaska and the owners of the oil and the pipeline. Presently almost all of the west coast surplus is being shipped through the Panama Canal or around Cape Horn. While there is a limit to the number of ships that can use the canal, there is no limit to the number of ships that can go around Cape Horn. The Cape Horn transit is limited due to the lack of deep water ports in the Gulf, which requires the use of small tankers or a lightering operation in the Gulf. Because of the higher transportation cost this is one of the least attractive options for the owners of the oil and the state of Alaska. A small portion of the surplus is being transported to Long Beach by the ARCO Company and through the recently reversed 16 inch Four Corners Pipeline to Red Messa, Utah. With additional pump stations the throughput of this line can be increased to 150,000 bpd. By connection to the nearby 16-inch Texas-New Mexico Pipeline, oil can be moved to Midland, Texas to connect with other pipelines that serve refineries in the southwest and east.

## Other Sources of Supply

There are several other actions or combination of events that would supply the northern tier states with additional crude oil to meet the transportation deficit that is projected. It is possible the Canadian Government could change or modify its plans to curtail exports of crude oil to the United States by 1982. There is no indication that this is going to happen, but if it did that would relieve all or much of the projected deficit. Additional imports from any country would be counter to this country's policy of energy independence and would adversely affect the balance of payments. There is presently some crude oil being exchanged by some U.S. refineries for Canadian crude. New exchange agreements could be negotiated that would increase supply in some of the Northern Tier states, but without construction of new ports or pipelines there is limited opportunity for such exchanges.

There is not believed to be substantial new opportunities for crude oil discoveries in the northern tier area. If the price of oil continues to increase, oil shale and more expensive secondary and tertiary recovery methods may be financially feasible. If new discoveries are made they would provide an alternative to the proposed project. It is also possible to change the existing transportation patterns in the Mid-Continent area to supply different refineries. Redirection of crude supplies would relieve individual refinery deficits, but because there is little idle capacity in Mid-Continent pipelines, redirection only serves to redistribute the deficit unless new pipelines are constructed. New pipelines from the Gulf ports would relieve a large amount of the transportation deficit and supply refineries in many, but not all, of the Northern Tier states.

Unit trains have also been proposed to connect to the Continental Pipeline at Cutbank, Montana to supply the Billings areas refineries. The proponent General American Transportation Corporation does not see this proposal as an alternative to a major west to east pipeline, but rather as a short term alternative for the Montana refineries. The tariff to Billings is projected at $2.24 per barrel from Port Westward on the lower Columbia River in Oregon to Billings, Montana. Unit trains to serve refineries further east would be less feasible as the rail cost is expected to be approximately two thirds of the total tariff.

## Reduced Demand

A final series of actions or events that would reduce the need for the proposed projects would be to reduce the demand for crude oil in the northern tier states. Further conservation of petroleum products would reduce demand. It must be understood that in all of the projections for demand, conservation has been taken into account. The accuracy of these projections is dependent on the validity of the assumptions that were used in determining them. For example, the projections for nuclear capacity installations were made prior to the accident at Three Mile Island, and any reduction or delay in nuclear installations could increase projected demand for petroleum products. If there is additional conservation beyond the amount projected in the different demand models, then the crude oil deficit is correspondingly reduced. Conversely, if conservation has been over projected then there is a greater deficit. It is difficult to discuss increased voluntary conservation without knowing the projected levels of conservation in the different models. Factors that could induce additional voluntary conservation would include; 1) increase of the conservation ethic among citizens for the nations and future generations benefit, 2) reduction of the supply of products to force conservation by inconvenience or denying access by the supplier, 3) increased conservation as a result of a higher price on the products, 4) mandatory conservation by government action. There is presently no evidence that demand for petroleum products is influenced in the U.S. by price. It is hypothesied that at a greatly increased price that there would be some conservation, but this remains unproven and would have to be a higher price then was assumed in the demand projections.

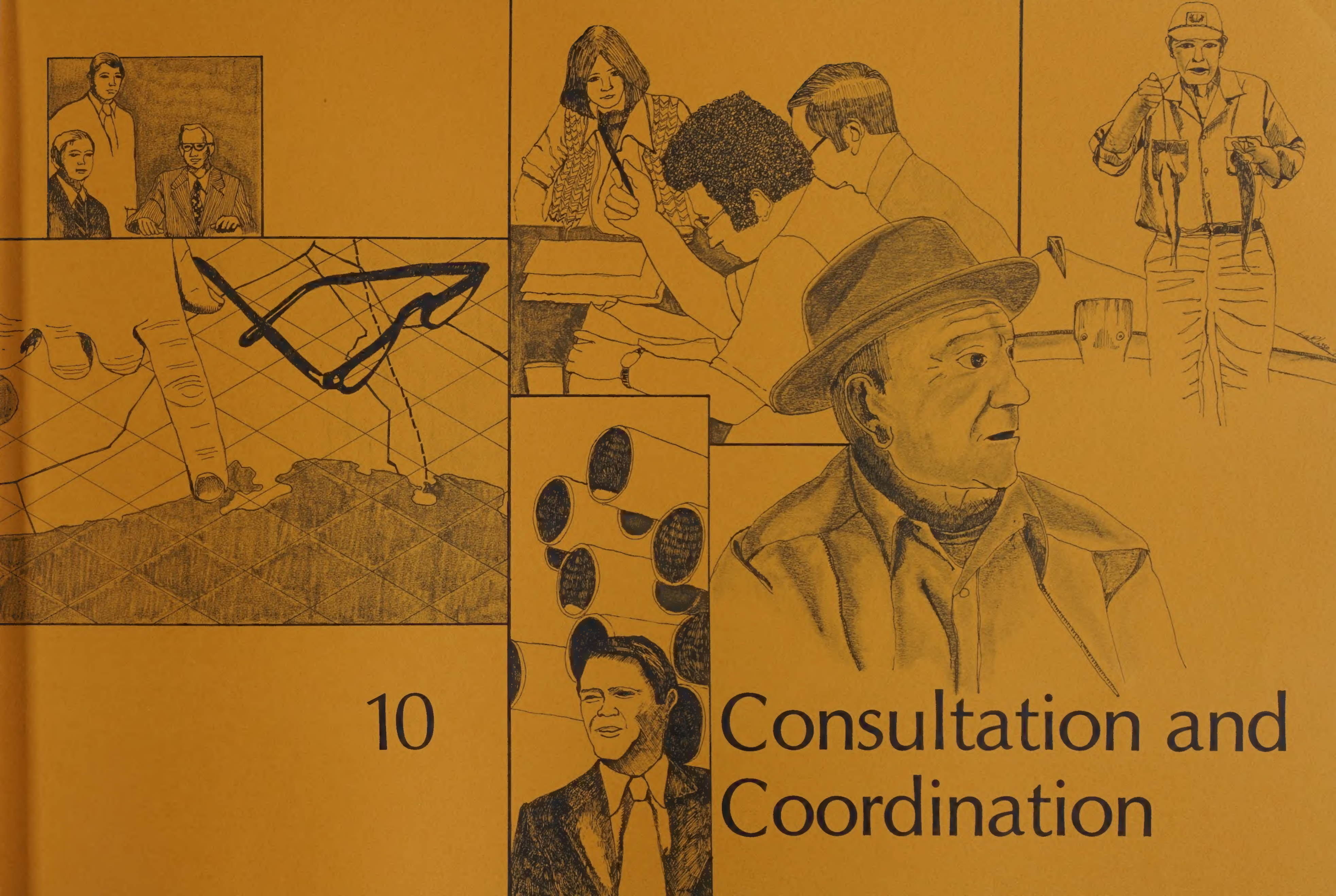
It is also possible for governmental actions to stimulate conservation, the opportunities range from a policy of not repairing or improving the highways system to the subsidy of mass transit to conserve gasoline. The National Energy Conservation Policy Act of 1978 provides 1) Utility Conservation Program for residences, 2)

Weatherization grants for low income families, 3) Solar energy loan programs, 4) Energy Conservation loan programs, 5) Grant programs for schools and hospitals, 6) Energy audits for public buildings, 7) Appliance efficiency standards, and 8) Civil penalties relating to automobile fuel efficiency. These types of programs can be increased or expanded to encourage conservation. To the extent that these types of actions are more successful than the assumptions in the demand projection, the projected deficit would be reduced. Finally, mandatory government controls such as rationing, or prohibiting the use of petroleum for certain purposes would reduce the projected deficit. The Powerplant and Industrial Fuel Act of 1976 prohibits the use of oil or natural gas in large new electric utility generation facilities or in large new industrial boilers and limits the use of natural gas of existing utility power plants. Similar legislation affecting the uses of other petroleum products could also conserve and reduce demand.

Importing petroleum products into the northern tier states would reduce demand for crude oil in these states but without state refineries and product pipelines and it would only relocate the projected deficit. In combination with other actions discussed previously, it could serve as a tool to relieve specific geographical shortages.

The substitution of other energy sources for petroleum products would also reduce the projected deficit. This could be encouraged by governmental action or could occur voluntarily because of a price imbalance between sources of energy.

None of the foregoing actions by themselves will eliminate the need for the proposed projects. A series of actions could serve to reduce the surplus of heavy crude on the west coast, supply crude oil to the Northern Tier refineries, or reduce the demand for crude oil in these states. There are unlimited combinations of the above actions, that could change the projected need for the proposals.



# 10

# Consultation and Coordination

# CHAPTER 10

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## 10.1 Introduction and Organization

The Bureau of Land Management (BLM) has consulted with federal, state, and local agencies as well as private companies and individuals concerning the development of this Environmental Statement (ES). Consultation with governmental agencies helped to insure proper coverage of all topical areas in the Environmental Statement and to minimize duplication of work. Public comment and participation was encouraged in the early development of the ES, prior to the completion of the draft ES (DES).

### Summary of Events Pertaining to the Preparation of the Environmental Statement

| | |
|---|---|
| 12-14-76 | Representatives of Northern Tier Pipeline Company (NTPC) met with the Department of the Interior (DOI) and other federal agencies to describe their proposal. |
| 02-22-77 | The Assistant Secretary, Land and Water Resources, DOI, sent a letter to NTPC outlining the requirements of the Mineral Leasing Act (pertaining to right-of-way requirements on federal lands) and of the need for an environmental statement. |
| 04-18-77 | NTPC filed a right-of-way application with the BLM, Montana State Director. |
| 01-19-78 | NTPC met with the Interagency Coordination Committee to describe its crude oil transportation proposal and to answer questions. |
| 02-08-78 | NTPC transmitted its Description of the Proposed Action (DPA) to the environmental statement team. |
| 03-08-78 | BLM began its first series of public information meetings. |
| 04-24-78 | Notice from NTPC of major changes in the proposed pipeline route in Idaho, Montana, North Dakota, and Minnesota. |
| 05-15-78 | The Interagency Coordination Committee met to discuss changes in the DPA, agency concerns, technical assistance, and schedule revision. |
| 06-06-78 | The Bureau of Indian Affairs advised BLM that the Tribal Council of the Confederated Salish and Kootenai Tribes refused NTPC permission to route the pipeline through the Flathead Indian Reservation. |
| 08-01-78 | NTPC amended the route designation and identified alternative route segments. |
| 08-01-78 | BLM began its second series of public information meetings. |
| 10-24-78 | NTPC notified the BLM of an additional route change (to be integrated into the FES). |
| 10-31-78 | The Interagency Coordination Committee met to discuss the preliminary draft ES and review comments. |
| 11-09-78 | Public Utility Regulatory Policies Act of 1978 (Public Law 95-617) (PURPA) approved. |
| 12-08-78 | Kitimat Pipe Line Ltd. applied to DOI for consideration under Title V of PURPA. |
| 12-08-78 | Northern Tier Pipeline Company applied to DOI for consideration under Title V of PURPA. |
| 12-08-78 | Northwest Energy Company applied to DOI for consideration under Title V of PURPA. |
| 01-11-79 | DES filed with the Environmental Protection Agency (EPA). |
| 02-06-79 | Trans Mountain Oil Pipe Line Corporation applied to DOI for consideration under Title V of PURPA. |
| 02-06-79 | Federal Register notice announcing public hearings on DES. |
| 03-06-79 | Public hearings were held in Coeur d'Alene, Idaho, and Billings, Montana. |
| 03-07-79 | Public hearings were held in Helena and Glendive, Montana. |
| 03-08-79 | Public hearings were held in Missoula, Montana, and Williston, North Dakota. |
| 03-12-79 | Public hearing was held in Ephrata, Washington. |
| 03-13-79 | Public hearings were held in Crookston, Minnesota, and Olympia, Washington. |
| 03-14-79 | Public hearings were held in Minot, North Dakota, and Seattle, Washington. |
| 03-15-79 | Public hearings were held in Bismarck, North Dakota, and Port Angeles, Washington. |
| 03-19-79 | Public hearing was held in Juneau, Alaska. |
| 03-20-79 | Public hearing was held in Skagway, Alaska. |
| 03-21-79 | Public hearing was reconvened in Juneau, Alaska. |
| 04-02-79 | End of period for public comment on DES. |
| 04-16-79 | Deadline for submission of project information from Title V applicants. |
| 05-22-79 | Federal Register notice announcing that FES would be available in August and that there would be a period for public comment on the FES. |
| 06-13-79 | The Coordination Committee met for a status report on the preparation of the FES. |

| | |
|---|---|
| 08-15-79 | Expected date for filing FES with EPA. |
| 09-27-79 | Expected end of period for public comment on FES. |

Organization of the Environmental Statement Team

The group responsible for preparation of the ES consisted of a project manager with staff for interagency coordination and public involvement, administrative support, technical analysis, typing, editing, preparation of graphics, and production. The technical team included specialists in the following disciplines:

- Air Quality and Noise
- Archaeology
- Economics
- Environmental Sciences
- Freshwater Fish Biology
- Geography
- Geology
- Hydrology
- Landscape Architecture
- Land Use
- Marine Biology
- Oceanography
- Engineering
- Sociology
- Soil Science
- Wildlife Biology
- Recreation

## 10.2 Data Collection

Data was collected by the BLM environmental statement team, five contractors, and seven federal agencies which had interagency agreements with BLM.

The environmental statement team collected data from federal, state, local, and private agencies. Under most circumstances the environmental statement team gathered and analyzed existing data. Data were collected through correspondence, telephone conversations, personal contacts, and field trips.

Contractors

BLM let six contracts during the preparation of the ES. BLM defined the contract work and reviewed, analyzed, and if necessary, revised the contract work before it was used.

Work was contracted to the following firms:

Fugro, Inc.

Fugro performed water quality analysis and geotechnic analysis along portions of the proposed NTPC pipeline route. Data collected includes information on soils, geology, hydrology, and water quality.

Oceanographic Insitute of Washington (OIW)

The work performed by OIW included analyses of the risks and trajectories of oil spills from tankers in-transit and at-berth, from fuel barges, storage tanks, and the pipeline for the NTPC proposal and several alternate port sites. The study also included a fire and explosion risk analysis for proposed NTPC facilities.

Oregon State University (OSU)

OSU tabulated and mapped existing land uses (i.e., urban, agricultural, rangeland, forestland, wetlands) within a 10 mile radius of NTPC's proposed port and onshore storage facilities. OSU also tabulated and mapped existing land uses along a 2-mile corridor of the portions of the pipeline alignment proposed by NTPC.

Science Applications, Inc. (SAI)

SAI prepared air quality analyses that included a description of the environment, environmental impacts resulting from the proposed action, mitigating measures, and impacts of alternative ports.

The principal study area was the NTPC port and onshore storage facilities area near Port Angeles, Washington. The study area also included the NTPC pipeline corridor and delivery facility sites.

SRI, International

The purpose of the SRI study was to collect social and economic data on existing and future conditions in communities potentially affected by the NTPC proposal and alternative route and port sites. Information was obtained on population, employment, income, taxes, and community facilities and services.

Boeing Computer Services

The purpose of the contract was to provide assistance in developing and maintaining a project management system, including computer time for schedule adjustments, graphic network displays, and tabular reports needed for project management.

Memos of Understanding and Interagency Agreements

Interagency agreements and memos of understanding were signed between BLM and seven other federal agencies: the Army Corps of Engineers, Department of Energy, Fish and Wildlife Service, Forest Service, Geological Survey, National Oceanic and Atmospheric Administration, and Soil Conservation Service. The agreements were established to hasten collection and analysis of data. The agencies provided BLM with copies of relevant environmental data from their files, collected and analyzed additional data in areas where they had specific expertise or program responsibility, and reviewed and provided comments on the ES as it was being prepared.

Other Assistance--Canadian

On March 21, 1978, members of the environmental statement team held informational meetings with the Canadian Department of Environment and Fisheries, and the Canadian Coast Guard, Ministry of Transportation, in Vancouver, British Columbia. In October 1978, members of the environmental statement team met with Fisheries Canada and Environment Canada. The major purpose of the meeting was to gain information on marine resources which could be affected by oil spills which could occur if the NTPC proposal or certain alternatives were constructed and operated.

In the FES potential impacts to Canadian resources are only briefly identified and not analyzed systematically. This treatment reflects a decision based on Executive Order 12114, which is explained in the Introduction to the FES.

## 10.3 Coordination Committee

A committee was established to coordinate activities between federal, state, and local agencies. The goal of the committee was to insure that the ES meets, to the greatest extent possible, the needs of permitting agencies.

The committee met twice during the data collection phase of preparation of the ES. A preliminary draft ES (PDES) was distributed to the committee and a meeting was held jointly to consider the comments on the PDES. The following federal, state, and local agencies were represented on the committee:

Federal

- Department of the Interior
  - Bureau of Indian Affairs
  - Bureau of Reclamation
  - Fish and Wildlife Service
  - Geological Survey
  - National Park Service

- Department of Agriculture
  - Forest Service
  - Soil Conservation Service

- Department of Commerce
  - National Oceanic and Atmospheric Administration

- Department of Defense
  - Army Corps of Engineers

- Department of Energy
  - Region X Office
  - Bonneville Power Administration

- Environmental Protection Agency
  - Region X Office

- Department of Transportation
  - Federal Highway Administration
  - U.S. Coast Guard

State

- State of Idaho
  - Bureau of Community Affairs

- State of Minnesota
  - Department of Natural Resources

- State of Montana
  - Department of Natural Resources and Conservation

- State of North Dakota
  - Energy and Natural Resources Coordinator

- State of Washington
  - Energy Facility Site Evaluation Council

Local

- Board of County Commissioners
  - Clallam County, Washington

- City Manager
  - Port Angeles, Washington

## 10.4 Public Involvement

It was the intent of the environmental statement team to promote public participation in all stages of the project. The goals were to maximize public involvement throughout the entire environmental statement process and to insure that public inputs and concerns were effectively considered and incorporated in the ES. Some components of this effort are described below.

News Releases

Six BLM news releases have been issued since the start of the environmental statement process. The first release was October 4, 1977, announcing BLM's task of preparing an environmental statement for the NTPC proposal. The second news release was February 22, 1978, announcing informal public meetings to be held along the proposed route. On July 18, 1978, it was announced that another set of informal public meetings would be held along NTPC's amended proposed route. A news release on January 12, 1979, announced the availability of the DES on the NTPC proposal. On February 16, 1979, public hearings on the DES were announced and four applicants which had filed for consideration under Title V of PURPA were identifed. On May 22, 1979, it was announced that the Department of the Interior will solicit comments on the four crude oil transportation systems proposed by the Title V applicants by establishing a period for public review and comment on the FES.

Solicitation of Public Inquires

In November 1977, a brochure entitled "Environmental Statement Procedure--Northern Tier Pipeline System" was produced. The brochure described the proposed route, lands to be crossed, areas to be served, sources of crude oil to be transported, the environmental statement procedure, and public participation process. The purpose of the brochure was to encourage public participation in the environmental statement preparation process.

The mailing list used to distribute public information notices has been continually expanded and updated. Public agencies, private individuals, newspapers, radio and television stations are on the list. As of July 1979, the mailing listed included more than 2,000 entries.

A toll free number, (800) 547-5532, was installed to provide the public with easy access to the environmental statement team throughout the preparation of the statement. Since responses to public inquiries are too numerous to be placed in the environmental statement, the correspondence pertaining to inquiries not answered by telephone are on file and open to public inspection.

Public Meetings

Prior to the completion of the DES, 12 informal public information meetings were held along the proposed pipeline route. The first set of meetings was held in March 1978.

Those meetings were held at:

| | |
|---|---|
| Port Angeles, Washington | March 8 |
| Olympia, Washington | March 9 |
| Missoula, Montana | March 14 |
| Coeur d'Alene, Idaho | March 15 |
| Spokane, Washington | March 16 |
| Billings, Montana | March 21 |
| Bismarck, North Dakota | March 22 |
| Crookston, Minnestoa | March 23 |

Because of a proposed route change by NTPC in April 1978, additional information meetings were held in August at:

| | |
|---|---|
| Grand Forks, North Dakota | August 1 |
| Minot, North Dakota | August 2 |
| Williston, North Dakota | August 3 |
| Helena, Montana | August 4 |

Public Hearings

Public hearings were held in March 1978, to receive comments on the DES. All testimony was recorded and transcribed and the transcripts are open to public inspection. Information about the hearings follows:

| Date | Place | Approximate Number Attending | Number Testifying |
|---|---|---|---|
| March 6 | Coeur d'Alene, ID | 35 | 6 |
| March 6 | Billings, MT | 30 | 8 |
| March 7 | Helena, MT | 45 | 8 |
| March 7 | Glendive, MT | 45 | 5 |
| March 8 | Missoula, MT | 140 | 33 |
| March 8 | Williston, ND | 35 | 4 |
| March 12 | Ephrata, WA | 35 | 8 |
| March 13 | Crookston, MN | 15 | 5 |
| March 13 | Olympia, WA | 50 | 10 |
| March 14 | Minot, ND | 25 | 4 |
| March 14 | Seattle, WA | 55 | 12 |
| March 15 | Bismarck, ND | 30 | 10 |
| March 15 | Port Angeles, WA | 150 | 51 |
| March 19 & 21 | Juneau, AK | 35 | 10 |
| March 20 | Skagway, AK | 110 | 20 |

## 10.5 Consultation Required by Statute

The environmental statement team has consulted with those agencies having jurisdiction or special expertise in accordance with the requirements of the Fish and Wildlife Coordination Act, the National Historic Preservation Act, the Endangered Species Act, and other applicable acts relating to the four crude oil transportation system proposals.

Consultation has been initiated with U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration concerning possible effects of the proposals on endangered and threatened species. In July 1978, BLM requested consultation, as required under Section 7 of the Endangered Species Act, from the Fish and Wildlife Service (FWS) concerning the NTPC project as then proposed. In April 1979, FWS responded and identified six threatened or endangered species that could be affected by the NTPC proposal. The potential impacts on those species are discussed in the Terrestrial Wildlife sections of chapter 3 or in the appropriate sections on Route Segment Alternatives of the Northern Tier Pipeline Proposal in chapter 9 of the FES.

In July 1979, BLM amended its request for consultation from FWS to include consideration of the portions of NTPC's proposed route which has been changed since the original request, and to consider the U.S. sections of the proposals from the other two Title V applicants. Since that time BLM has responded to requests from FWS to provide additional information about the potential areas of impact of the several proposals. At the time of final preparation of the FES this process of consultation was continuing.

In July 1979, BLM also requested information from the National Marine Fisheries Service (NMFS) concerning endangered species and their habitats as provided for under Section 7(c) of the Endangered Species Act. All four of the Title V proposals would involve tanker sea legs from Valdez, Alaska, and from foreign ports in U.S. territory. This consultation process was also continuing at the time of final preparation of the FES.

Following discussion with the Advisory Council on Historic Preservation, BLM initiated consultation with the Advisory Council and the State Historic Preservation Officers of the five states which would be affected by the NTPC proposal. The purpose of the consultation was to develop an adequate course of action for compliance with Section 106 of the Historic Preservation Act should NTPC's proposed project be approved. In July 1978, BLM initiated the process to establish a Memorandum of Agreement with the Advisory Council and the State Historic Preservation Offices which would state how BLM would proceed to comply with Section 106 and other applicable laws. The procedure which was established would also apply to the proposals from NEC and TMC. If one or more of the proposed systems which would affect cultural resources in the United States is approved, a Memorandum of Agreement would be established between the appropriate consulting agencies.

The Council on Environmental Quality regulations note that the Office of Management and Budget Circular A-95 (Revised) provides a means of securing the views of state and local environmental agencies through its system of clearinghouses. Copies of the DES were sent to statewide clearinghouses of the six states which would be affected by one or more of the proposed projects and to appropriate areawide clearinghouses.

## 10.6 Distribution of the Environmental Statement

The DES was available for public inspection at the BLM office of Public Affairs in Washington, D.C., at BLM state and district offices in areas that would be affected by one or more of the proposals, and at most city and county offices and public libraries along the proposed pipeline routes. Approximately 1,500 copies of the DES were distributed for review to federal, state and local agencies, members of Congress, to the U. S. Department of State for distribution to interested agencies of the government of Canada, and to public and private interest groups and individuals.

The FES will be available for public inspection at the same places noted in the paragraph above. The FES will be distributed to those who received the DES, to organizations and individuals that made comments on the adequacy of the DES, and to those who request the FES from the BLM.

## 10.7 Comments Received on the Draft Environmental Statement and Responses

A total of 250 comment letters were received from 31 federal agency offices, 2 Indian tribal organizations, 38 state agency offices, 34 local government agencies, 42 organizations, and 103 individuals. The comment letters were numbered consecutively as they were received by the environmental statement team. Those letters postmarked before the end of the public comment period (through April 2, 1979) are numbered 1 to 180. Additional letters, postmarked from April 2 through May 15, 1979, are numbered L-1 through L-60. Some numbers were mistakenly assigned to pieces of correspondence which were not official comments on the DES, and they are so noted in the list of comment letters received. Occasionally a number was assigned to a comment letter which actually contained several discrete parts and the parts are indicated by capital letters following the number (for example 82A and 82B). All numbered comment letters are printed in the following pages. All comment letters postmarked after May 15 were reviewed and filed but could not be included in the FES.

Comments are numbered in consecutive order on each letter, with the exception of comment letter 126, where each titled section is numbered separately. Most comments and responses can be identified by a letter number followed by a comment number (70-12 or L-13-46). Comments and responses for comment letter 126 are identified with a word as well, for example: 126-Alternatives, 83. All responses are printed in the responses to comments section which follows the entire comment letters section. The list of comment letters received indicates the page numbers of the letter and its responses, if any. Also, at the end of chapter 10, there is a comment letter index in which the letters are arranged in categories.

Comments which provided relevant information, which raised questions about the adequacy of the DES, or requested clarification about procedures or analyses were responded to specifically. Specific responses were written for all such comments contained in Letters 1 through 180. For letters L-1 through L-60 specific responses were written only for those letters received from federal agencies. All other letters with L-numbers were reviewed by the appropriate members of the environmental statement team. Revisions in the text of the FES were made if required, but no specific responses were written for publication in chapter 10.

General responses, as well as responses to specific comments, were written for a number of comment letters in order to explain an overall approach to issues or questions raised by the letters. Similar comments were often made by more than one reviewer. In most cases a response has been written for the comment the first time it is raised, with later comments being referred back to the full response. A number of sections of the FES (such as Biological Components of Marine Resources) are complete revisions of the DES material. In many cases the response to comments on those sections is simply to refer to the revised section of the FES.

A total of 194 people gave testimony at the 15 public hearings held during March 1979. None of that testimony has been printed in the FES. Many speakers were indicating their support or opposition to one or more of the proposals. A number of the speakers sent in written copies of their testimony which have been included among the comment letters. These materials which either did not require a response or which duplicated other comments were eliminated from consideration. Then the remainder of the testimony was carefully examined by the environmental statement team to see if any issues pertinent to the adequacy of the DES were raised which had not already been identified and responded to by either revisions in the FES or written responses in chapter 10. No pertinent new comments were identified.

A number of general concerns were raised frequently in comment letters and hearing testimony. Many people, especially those along proposed pipeline routes, requested site specific details about the nature and precise location of potential impacts. They often indicated that they believed the DES to be inadequate because of this lack of detailed impact analyses. It is true that this ES lacks site specific analyses, especially along proposed pipeline routes. This is unavoidable since this ES is a report on the analysis of four proposals, each of which is only in the early stages of planning. Responsible planning and regulation of projects of the scale of major trans-continental pipeline systems require that relatively general environmental analyses be performed during the preliminary stages of project development. Some specific potential impacts and many general types of potential impacts have been identified. This makes it possible for later stages of planning and project review to include consideration of environmental variables and to incorporate route adjustments if appropriate. However, because of the nature, purpose, and timing of this ES, it has generally not been possible to evaluate potential impacts of the proposals on particular resources at specific, precise locations.

Residents of two areas, Island County in western Washington, and the Ninemile Valley in western Montana, provided numerous comments on the inadequacy of the DES treatment of resources in their areas. Both are areas which were only recently identified as revised locations for the proposed pipeline routes. Many people in the Island County area requested that BLM extend the public comment period beyond April 2, 1979, and that BLM issue a revised DES. The decisions about issuing the FES and providing a period for public review and comment of the FES are outlined in the Introduction to the FES. Expanded discussions of the Puget Sound area are included in the sections on the NTPC and the TMC proposals, and the discussion of potential impacts in the Ninemile Valley are incorporated into the sections in the NTPC proposal.

Another major area of concern expressed in comments is the potential for adverse impacts at Port Angeles, Washington, the proposed site for the NTPC port facility. These concerns have been presented and responded to in great detail in the comment letters and responses to comments which follow.

The general topic of greatest concern to many reviewers is the potential for oil spills, both at sea from tankers and on land from pipelines. Considering that an oil spill could have impacts on virtually all components of the environment, it is not surprising that it is a major concern. The sections on the FES which deal with Oil Spill, Fire, and Explosion Risk Analyses are more complete and detailed than was possible in the DES. In addition, potential impacts have been identified more clearly in the impact analysis sections of the FES. Finally, many responses were written to specific comments about oil spill risk analyses leak detection systems, and potential oil spill impacts.

LIST OF COMMENT LETTERS RECEIVED

| LETTER NO. | AGENCY OR INDIVIDUAL |
|---|---|
| 1 | Peter Suenpolla, Ashland, OR |
| 2 | City Plan Commission, Spokane, WA |
| 3 | Mary Pinkham, Seattle, WA |
| * 4 | State of Washington, Planning and Community Affairs Agency, Olympia, WA |
| 5 | Mrs. Harry B. McFarland, Port Angeles, WA |
| 6 | Emmy K. Ibison, Bozeman, MT |
| 7 | John David Gilbert, Bozeman, MT |
| * 8 | U.S. Dept. of Health, Education & Welfare, Region VIII, Denver, CO |
| 9 | Comment number assigned in error |
| * 10 | U.S. Dept. of Transportation, Federal Aviation Administration, Rocky Mountain Region, Aurora, CO |
| * 11 | Montana Historical Society, Historic Preservation Office, Helena, MT |
| 12 | Eileen J.K. Holmes, Port Angeles, WA |
| * 13 | U.S. Dept. of Housing & Urban Development, Region X, Seattle, WA |
| * 14 | Michael J. Howell, Jr., Wallace, ID |
| 15 | North Dakota State Planning Division, Bismarck, ND |
| * 15A | Williston Basin Regional Council, Williston, ND |
| * 15B | Ward County County Commission, Kenmare, ND |
| 15C | Pierce County County Commission, Orrin, ND |
| * 15D | University of North Dakota, Dept. of Geology, Grand Forks, ND |
| 16 | U.S. Dept. of Transportation, U.S. Coast Guard, Ninth District, Cleveland, OH |
| 17 | North Dakota State Planning Division, Bismarck, ND |
| 17A | Governor's Office, State Capitol, Bismarck, ND |
| * 17B | City Planning & Zoning Commission, Grand Forks, ND |
| * 18 | Eric Wunz, Shelton, WA |
| 19 | Robert Cerrier, Bozeman, MT |
| * 20 | U.S. Dept. of Transportation, Federal Aviation Administration, Northwest Region, Seattle, WA |
| 21 | Beth Yount, Belgrade, MT |
| * 22 | Department of Public Utilities, Tacoma, WA |
| * 23 | State of Washington, Dept. of Natural Resources, Olympia, WA |
| * 24 | U.S. Dept. of Transportation, Federal Highway Administration, Region 5, Homewood, IL |
| * 25 | U.S. Dept. of Interior, Fish & Wildlife Service, Twin Cities, MN |
| * 26 | U.S. Dept. of Interior, Heritage Conservation & Recreation Service, Lake Central Region, Ann Arbor, MI |
| * 27 | Clallam County Fire District #3, Carlsborg, WA |

* COMMENT LETTERS WHICH HAVE RECEIVED SPECIFIC RESPONSES ARE INDICATED WITH AN ASTERISK.

| | |
|---|---|
| 28 | Mrs. Rodney L. Anderson, Bemidji, MN |
| 29 | Central Montana Publishing Company, Lewiston, MT |
| 30 | North Dakota State Planning Division, Bismarck, ND |
| * 30A | North Dakota State Soil Conservation Committee, Bismarck, ND |
| 31 | Williston Cooperative Credit Union, Williston, ND |
| 32 | Lee Vanica, Billings, MT |
| 33 | North Dakota State Planning Division, Bismarck, ND |
| * 33A | North Dakota Highway Dept., Bismarck, ND |
| * 34 | Charles E. Kay, Fairbanks, AK |
| * 35 | Dan J. Foran, Missoula, MT |
| * 36 | Puget Sound Council of Governments, Seattle, WA |
| * 37 | North Central Planning Council, Devils Lake, ND |
| 38 | Board of County Commissioners, County of Musselshell, Roundup, MT |
| 39 | Connie N. Townsend, White Sulphur Springs, MT |
| * 40 | Calvin M. Entinger, Missoula, MT |
| 41 | George Wuerthner, Missoula, MT |
| 42 | Lori Hudak, Missoula, MT |
| * 43 | State of Idaho Division of Budget, Policy Planning & Coordination, Boise, ID |
| 44 | Montana Water Development Association, Billings, MT |
| 45 | Eve Smith, South Pender Island, B.C. |
| 46 | Steve Karkanen, Missoula, MT |
| * 47 | U.S. Dept. of Interior, Bureau of Reclamation, Pacific Northwest Region, Boise, ID |
| 48 | George Benson, Arlee, MT |
| * 49 | Tahoma Audubon Society, Tacoma, WA |
| * 50 | Zane and Gloria Zell, Shelby, MT |
| * 51 | Joe Murphy, Helena, MT |
| 52 | Don McDonald, Port Angeles, WA |
| * 53 | Cascadia Research Collective, Olympia, WA |
| 54 | D.E. and Shirley Hermann, Sparks, NV |
| * 55 | Alaska Conservation Society, Taku Chapter, Juneau, AK |
| 56 | E. Zahn, Port Ludlow, WA |
| 57 | Henry Bechtold, Sekiu, WA |
| * 58 | North Dakota Forest Service, Deputy State Forester, Bottineau, ND |
| * 59 | North Dakota Game & Fish Dept., Bismarck, ND |
| * 60 | North Dakota Parks & Recreation Dept., Mandan, ND |
| 61 | North Dakota State Planning Division, Bismarck, ND |
| 61A | North Central Planning Council, Devils Lake, ND |
| * 62 | Olympic Peninsula Audubon Society, Sequim, WA |
| * 63 | Robert Barker, East Missoula, MT |
| * 64 | William Z. MacDonald, Huson, MT |
| 65 | Mr. and Mrs. Peyton Moncure, Missoula, MT |
| * 66 | Minnesota Soil & Water Conservation Districts, Clearwater District, Bagley, MN |
| * 67 | Everett L. Hassell, Port Angeles, WA |
| * 68 | Thomas Healy, Skagway, AK |
| 69 | State of Alaska, Office of the Governor, Juneau, AK |
| * 69A | Office of Administration, Valdez, AK |
| 70 | Port Angeles Central Labor Council, Port Angeles, WA |
| * 71 | South Whidbey Planning Council, Langley, WA |
| 72 | Josephine Jurgelett, Haines, AK |
| * 73 | Island Action Coalition, Oak Harbor, WA |
| * 74 | Homer Frazier, Sequim, WA |
| * 75 | Association of Western Pulp & Paper Workers, Port Angeles Local 155, Port Angeles, WA |
| * 76 | Washington State Parks & Recreation Commission, Olympia, WA |
| * 77 | Barbara A. Kalen, Skagway, AK |
| 78 | Comment number assigned in error |
| * 79 | Island County Historical Society, Coupeville, WA |
| 80 | Comment number assigned in error |
| * 81 | Camano Island Homeowners Association, Camano Island, WA |
| 82 | Planning Dept, Adams & Lincoln Counties, Othello, WA |
| * 82A | Lincoln County, WA |
| * 82B | Adams County, WA |
| 83 | State of Montana, Office of the Governor, Helena, MT |
| * 84 | Northern Tier Pipeline Company, Billings, MT |
| 85 | Muckleshoot Indian Tribe, Auburn, WA |
| * 86 | U.S. Environmental Protection Agency, Region X, Seattle, WA |
| * 87 | Ken Knudson, Helena, MT |
| * 88 | North Dakota Forest Service, State Nursery, Towner, ND |
| * 89 | Lynn Canal Conservation, Inc., Haines, AK |
| * 90 | John R. Mather, Port Angeles, WA |
| * 91 | Larry J. Peterman, Helena, MT |
| * 92 | Bill Schneider, Helena, MT |
| * 93 | Friends of the Earth, Seattle, WA |
| * 94 | Minnesota Dept. of Transportation, St. Paul, MN |
| * 95 | Environmental Information Center, Missoula, MT |
| 96 | Kathy Reineke, Helmville, MT |
| 97 | Mr. and Mrs. Terry L. Owen, Thompson Falls, MT |
| * 98 | Bruce and Rebecca E. Roths, Polebridge, MT |
| * 99 | Public Utility District of Clallam County, Port Angeles, WA |
| 100 | Comment number assigned in error |
| *101 | Maureen P. Swanson, North Bend, WA |
| 102 | Gardner Cromwell, Bonner, MT |
| *103 | Philip and Margaret H. Wright, Missoula, MT |
| 104 | Garfield-McCone Legislative Association, Circle, MT |
| 105 | League of Women Voters, Spokane, WA |
| *106 | Edwin J. Hart, Port Angeles, WA |
| *107 | James R. Frye, Thompson Falls, MT |
| 108 | Robert G. Abrams, Coupeville, WA |
| 109 | Jan M. Chapman, Oak Harbor, WA |
| 110 | Joe Kipphut, Missoula, MT |
| 111 | Elmer Christman, Seattle, WA |
| *112 | Craig A. Ritchie, Port Angeles, WA |
| 113 | State of Idaho, Division of Budget, Policy Planning & Coordination, Boise, ID |

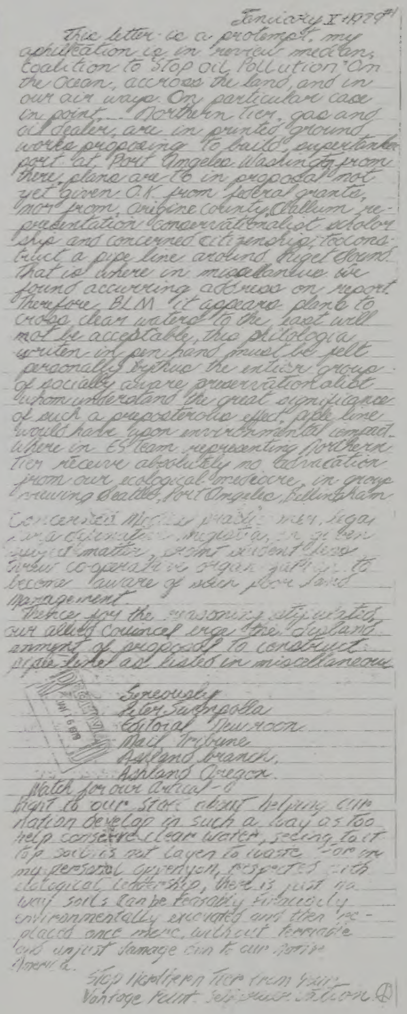
| | |
|---|---|
| *113A | Natural Resources Bureau, Boise, ID |
| *113B | Dept. of Fish & Game, Boise, ID |
| *113C | Dept. of Health & Welfare, Division of Environment, Boise, ID |
| *113D | Dept. of Water Resources, Boise, ID |
| *114 | League of Women Voters of Washington, Seattle, WA |
| *115 | John R. McDowell, DDS, Thompson Falls, MT |
| *116 | Touchette Hill Homeowner's Association, Frenchtown, MT |
| 117 | Walter I. Lewis, Oak Harbor, WA |
| *118 | Lloyd R. and Caroline Jones, Plaza, ND |
| *119 | John R. Mather, Port Angeles, WA |
| *120 | Valleys Preservation Council, Huson, MT |
| *121 | Valleys Preservation Council, Huson, MT |
| 122 | Comment number assigned in error |
| *123 | Mason Regional Planning Council, Shelton, WA |
| *124 | U.S. Dept. of Agriculture, Soil Conservation Service, Portland, OR |
| *125 | Rosemary Cockrill, Port Angeles, WA |
| *126 | Clallam County Board of Commissioners, Port Angeles, WA (Task Force) |
| *127 | Karen Tharaldsen, Port Angeles, WA |
| *128 | Paula Doherty, Port Angeles, WA |
| 129 | Patricia A. Burkhardt, Portland, OR |
| 130 | City of Skagway, Office of the Mayor, Skagway, AK |
| *131 | John R. Mather, Port Angeles, WA |
| 132 | Alan R. Drengson, Victoria, B.C. |
| 133 | Comment number assigned in error |
| *134 | Puget Sound Gillnetter's Auxillary, Oak Harbor, WA |
| 135 | Puget Sound Gillnetter's Association, Oak Harbor, WA |
| *136 | U.S. Dept. of Interior, Bureau of Indian Affairs, Portland Area Office, Portland, OR |
| *137 | City of Port Angeles, City Attorney, Port Angeles, WA |
| *138 | Dept. of Planning & Community Development, King County, WA |
| *139 | State of North Dakota, State Historical Society, Bismarck, ND |
| 140 | Comment number assigned in error |
| *141 | State of Washington, Dept. of Fisheries, Olympia, WA |
| *142 | Richard C. Kerr III, Eureka, MT |
| *143 | Washington Trollers Association, Seattle, WA |
| *144 | Marsha Helton, Juneau, AK |
| *145 | Foothills Oil Pipe Line, Ltd., Washington, D.C. |
| 146 | Crosswoods Homeowner's Association, Oak Harbor, WA |
| *147 | Cascadia Research Collective, Olympia, WA |
| *148 | R. Scott Duncan, Huson, MT |
| *149 | Atlantic Richfield Co., Cherry Point Refinery, Ferndale, WA |
| *150 | Steve Shapiro, Langley, WA |
| *151 | Levi Ross, Port Townsend, WA |
| *152 | Dale and Candi Gunderson, Thompson Falls, MT |
| 153 | Residents of Helmville-Ovando Valley, Helmville-Ovando Valley, MT |
| *154 | Rolfe S. Johnson, Oak Harbor, WA |
| 155 | Hans A. Olsen, Oak Harbor, WA |
| *156 | Island Action Coalition, Oak Harbor, WA |
| *157 | Town of Coupeville, Coupeville, WA |
| *158 | Island Action Coalition, Oak Harbor, WA |
| *159 | Harold E. Froehlich, St. Paul, MN |
| *160 | Grant-Lincoln-Adams County Conference of Governments, Ephrata, WA |
| *161 | Island County Historical Society, Coupeville, WA |
| *162 | U.S. Dept. of Energy, Region X, Seattle, WA |
| *163 | Thomas H.S. Brucker, Seattle, WA |
| *164 | Clallam County Commissioner and County Planner, Port Angeles, WA |
| *165 | Clallam County Environmental Coordinator, Port Angeles, WA |
| *166 | City Manager, Port Angeles, WA |
| 167 | Eloise W. Kailin, Sequim, WA |
| 168 | David R. Hamm, St. Paul, MN |
| *169 | Elisabeth Albecker, Skagway, AK |
| *170 | Protect the Peninsula's Future, Sequim, WA |
| *171 | No Oilport Inc., Port Angeles, WA |
| *172 | Loretta M. Pettinato, Huson, MT |
| *173 | Jimmie Jean Cook, Coupeville, WA |
| 174 | Island County Planning Dept., Coupeville, WA |
| 175 | Wayne Eberhardt, Haines, AK |
| *176 | University of North Dakota, Dept. of Biology, Oakville Prairie Field Station, ND |
| *177 | United Fishermen & Allied Worker's Union, Vancouver, B.C. |
| 178 | Skagway Chamber of Commerce, Skagway, AK |
| 179 | Arthur A. and Mary J. Heine and Catherine Hopper, Huson, MT |
| *180 | Washington State Legislature, Legislative Transportation Committee, Olympia, WA |

The following comments were received in the Portland BLM office with Postmarks dated after April 2, 1979, the close of the public comment period.

| | |
|---|---|
| L-1 | Comment number assigned in error |
| L-2 | R. H. Loutzenhiser, Camano Island, WA |
| L-3 | Ellen C. Seeley, Port Angeles, WA |
| L-4 | Lt. Col. and Mrs. C.M. Kerston, Camano Island, WA |
| L-5 | Hood Canal Environmental Council, Bremerton, WA |

| | |
|---|---|
| *L-6 | U.S. Dept. of Interior, Fish & Wildlife Service, D.C. |
| L-7 | Planning & Zoning Commission, City of Kupreanof, AK |
| L-8 | City of Ephrata, Ephrata, WA |
| L-9 | W. Edward Allan, Ephrata, WA |
| L-10 | The Tulalip Tribes, Marysville, WA |
| L-11 | Office of the Mayor, Seattle, WA |
| L-12 | Comment number assigned in error |
| L-13 | Ken Pickard, Coupeville, WA |
| L-14 | Sierra Club Legal Defense Fund, Juneau, AK |
| L-15 | Jefferson-Port Townsend Regional Council, Port Townsend, WA |
| L-16 | Comment number assigned in error |
| L-17 | Hazel Coughlin, Helmville, MT |
| L-18 | U.S. Dept. of Commerce, Assistant Secretary for Science & Technology, D.C. |
| *L-18A | Maritime Administration, D.C. |
| L-18B | National Oceanic & Atmospheric Administration Rockville, MD |
| *L-18C | National Oceanic & Atmospheric Administration Seattle, WA |
| *L-18D | National Oceanic & Atmospheric Administration Seattle, WA |
| *L-18E | National Oceanic & Atmospheric Administration Seattle, WA |
| *L-18F | National Oceanic & Atmospheric Administration Portland, OR |
| L-19 | Comment number assigned in error |
| L-20 | Clallam County Governmental Conference, Port Angeles, WA |
| L-21 | State of Wisconsin, Dept. of Natural Resources, Madison, WI |
| *L-22 | U.S. Dept. of Agriculture, Forest Service, D.C. |
| L-23 | Adele Coughlin, Helmville, MT |
| L-24 | Williston Basin Regional Council for Development, Williston, ND |
| L-25 | Donald R. Sullivan, Helmville, MT |
| L-26 | James W. Coughlin, Helmville, MT |
| L-27 | Milton and Evelyn Reich, Thompson Falls, MT |
| L-28 | Comment number assigned in error |
| L-29 | Edward G. Coughlin, Helmville, MT |
| L-30 | Comment number assigned in error |
| *L-31 | U.S. Dept. of Housing & Urban Development, Office of Community Planning & Development, Region X, Seattle, WA |
| *L-32 | U.S. Dept. of Transportation, Office of the Secretary, D.C. |
| L-33 | Comment number assigned in error |
| L-34 | Harry E. Wilbert, Freeland, WA |
| L-35 | Ann M. Sullivan, Helmville, MT |
| L-36 | Steven Williams, Lopez, WA |
| L-37 | Holmes Harbor Conservation Club, Freeland, WA |
| L-38 | Comment number assigned in error |
| L-39 | Board of Commissioners, Island County, WA |
| L-40 | Harriette Hayes, Oak Harbor, WA |
| L-41 | Comment number assigned in error |
| L-42 | State of Washington, Office of Archaeology & Historic Preservation, Olympia, WA |
| L-43 | Coalition Against Oil Pollution, Seattle, WA |
| L-44 | State of Washington, Office of Financial Management, Olympia, WA |
| L-44A | Washington State Energy Office, Olympia, WA |
| L-44B | Dept. of Ecology, Olympia, WA |
| L-44C | Dept. of Transportation, Olympia, WA |
| L-44D | Dept. of Game, Olympia, WA |
| L-44E | Dept. of Natural Resources, Olympia, WA |
| L-44F | Washington State Parks & Recreation Commission, Olympia, WA |
| L-44G | Dept. of Fisheries, Olympia, WA |
| L-45 | U.S. Dept. of Interior, Heritage Conservation & Recreation Service, D.C. |
| *L-45A | Heritage Conservation & Recreation Service, Northwest Region, Seattle, WA |
| *L-45B | Heritage Conservation & Recreation Service, Mid-Continent Region, Denver, CO |
| *L-45C | Heritage Conservation & Recreation Service, D.C. |
| *L-46 | U.S. Dept. of Interior, National Park Service, D.C. |
| L-47 | Comment number assigned in error |
| L-48 | Mr. and Mrs. Norman Meitner, Huson, MT |
| L-49 | Comment number assigned in error |
| L-50 | Ann Sullivan, Helmville, MT |
| L-51 | Susan Appelt, Huson, MT |
| L-52 | Valleys Preservation Council, Huson, MT |
| L-53 | Mr. and Mrs. Ralph Fornfeist, Choteau, MT |
| *L-54 | U.S. Dept. of Defense, Corps of Engineers, Seattle District, Seattle, WA |
| L-55 | F. & S. Hager, Huson, MT |
| L-56 | Debbie Bell, Huson, MT |
| L-57 | Steve Nienhaus, Langley, WA |
| L-58 | Advisory Council on Historic Preservation, Denver, CO |
| L-59 | Jeannie Siegler, Huson, MT |
| L-60 | Marjorie Pettinato, Missoula, MT |

**1**



January X 1979

This letter is a protempt, my aplication is in review median, Coalition to "Stop oil Pollution" On the Ocean, accross the land, and in our air ways. On particular case in point... Northern Tier, gas and oil dealer, are in printed ground works proposing to build, supertanker port at Port Angeles Washington from there, plans are to in proposal not yet given O.K. from federal grants, nor from, origine county, Clallum re-presentation conservationalist scholorship and concerned citizenship, to construct a pipe line around Puget Sound. That is where in miscellaneous we found accurring address on report. Therefore, BLM it appears plans to cross clear waters to the East will not be acceptable, this philologia writen in pen hand must be felt personally by thus the entire group of socially aware preservationalist whom understand the great significance of such a preposterous effect, pipe line would have upon environmental compact. Where in ES team representing Northern Tier receive absolutely no advacation from our ecological measure, in group viewing Seattle, Port Angeles, Bellingham

Concerned [illegible] [illegible] men, legal [illegible] [illegible], [illegible] [illegible] matter, [illegible] student [illegible] co-operative organ[illegible] to become aware of such poor land management.

Thence for the reasoning stipulated, our allied council urge the [illegible] [illegible] of proposal to construct pipe line as listed in miscellaneous

Sincerely
Peter Sutnpolla
Editoral Newsroom
Mail Tribune
Ashland branch,
Ashland Oregon.

Watch for our Artical - [illegible] [illegible] to our stor about helping our nation develop in such a way as too help conserve clear water, seeing to it top soil is not layen to waste. For in my personal opinion, respected with ecological leadership, there is just no way soils can be [illegible] [illegible] environmentally excavated and then re-placed once more, without terrible and unjust damage [illegible] to our [illegible] America.

Stop Northern Tier from your Vantage Point. [illegible] [illegible].

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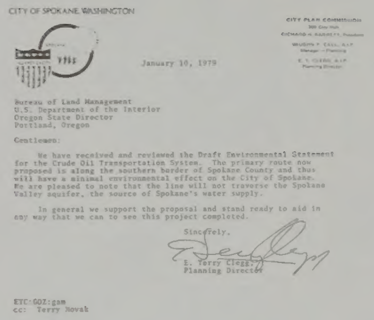
**2**



CITY OF SPOKANE WASHINGTON

CITY PLAN COMMISSION
300 City Hall
RICHARD H. BARRETT, President
VAUGHN P. CALL, A.I.P.
Manager — Planning
E. T. CLEGG, A.I.P.
Planning Director

January 10, 1979

Bureau of Land Management
U.S. Department of the Interior
Oregon State Director
Portland, Oregon

Gentlemen:

We have received and reviewed the Draft Environmental Statement for the Crude Oil Transportation System. The primary route now proposed is along the southern border of Spokane County and thus will have a minimal environmental effect on the City of Spokane. We are pleased to note that the line will not traverse the Spokane Valley aquifer, the source of Spokane's water supply.

In general we support the proposal and stand ready to aid in any way that we can to see this project completed.

Sincerely,

E. Terry Clegg,
Planning Director

ETC:GOZ:gam
cc: Terry Novak

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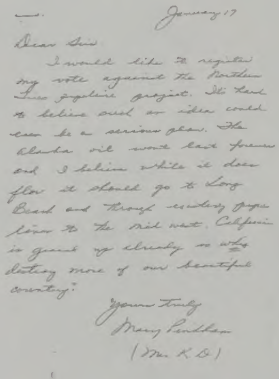
**3**



January 17

Dear Sir

I would like to register my vote against the Northern Tier pipeline project. It's hard to believe such an idea could even be a serious plan. The Alaska oil won't last forever and I believe while it does flow it should go to Long Beach and through existing pipe lines to the mid west. California is giving up already so why destroy more of our beautiful country?

Yours truly
Mary Pendleton
(Mrs. K. D.)

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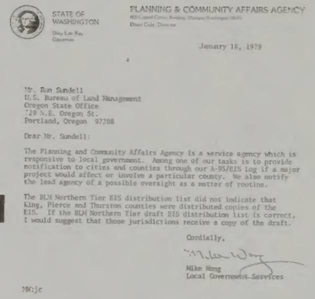
**4**



STATE OF WASHINGTON
Dixy Lee Ray
Governor

PLANNING & COMMUNITY AFFAIRS AGENCY
[illegible]
Dean Cole, Director

January 18, 1979

Mr. Ron Sundell
U.S. Bureau of Land Management
Oregon State Office
729 N.E. Oregon St.
Portland, Oregon 97208

Dear Mr. Sundell:

The Planning and Community Affairs Agency is a service agency which is responsive to local government. Among one of our tasks is to provide notification to cities and counties through our A-95/EIS Log if a major project would affect or involve a particular county. We also notify the lead agency of a possible oversight as a matter of routine.

① The BLM Northern Tier EIS distribution list did not indicate that King, Pierce and Thurston counties were distributed copies of the EIS. If the BLM Northern Tier draft EIS distribution list is correct, I would suggest that those jurisdictions receive a copy of the draft.

Cordially,

Mike Wong
Mike Wong
Local Government Services

MW:jc

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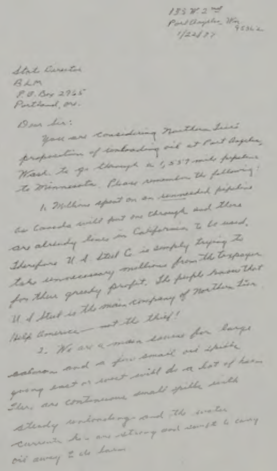
**5**



135 W. 2nd
Port Angeles, Wa.
98362
1/22/79

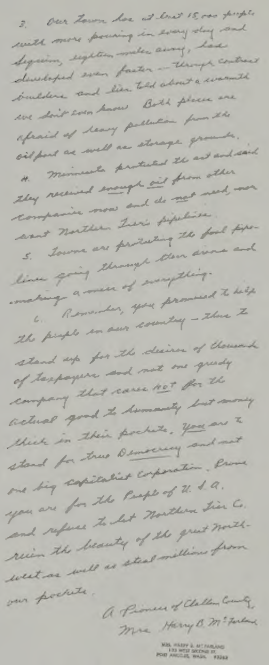
State Director
BLM
P.O. Box 2965
Portland, Ore.

Dear Sir:

You are considering Northern Tier's proposition of unloading oil at Port Angeles, Wash. to go through a 1,557 mile pipeline to Minnesota. Please remember the following:

1. Millions spent on an unneeded pipeline as Canada will put one through and there are already lines in California to be used. Therefore U. S. Steel Co. is simply trying to take unnecessary millions from the taxpayer for their greedy profit. The people know that U. S. Steel is the main company of Northern Tier. Help America — not the thief!

2. We are a main source for large salmon and a few small oil spills going east or west will do a lot of harm. There are continuous small spills with steady unloading and the water currents here are strong and could [illegible] carry oil away to do harm.



3. Our town has at least 15,000 people with more pouring in every day and Sequim, eighteen miles away, has developed even faster — through contract builders and lies told about a warmth we don't even know. Both places are afraid of heavy pollution from the oil port as well as storage grounds.

4. Minnesota protested the act and said they received enough oil from other companies now and do not need, nor want Northern Tier's pipeline.

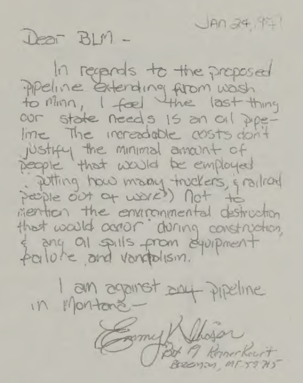
5. Towns are protesting the fuel pipe-lines going through their towns and making a mess of everything.

6. Remember, you promised to help the people in our country — there to stand up for the desires of thousands of taxpayers and not one greedy company that cares NOT for the actual good to humanity but money thick in their pockets. You are to stand for true Democracy and not one big capitalist corporation. Prove you are for the People of U. S. A. and refuse to let Northern Tier Co. ruin the beauty of the great North-west as well as steal millions from our pockets.

A Pioneer of Clallam County,
Mrs. Harry B. McFarland

MRS. HARRY B. McFARLAND
135 WEST SECOND ST.
PORT ANGELES, WASH. 98362

**6**



JAN 24, 1979

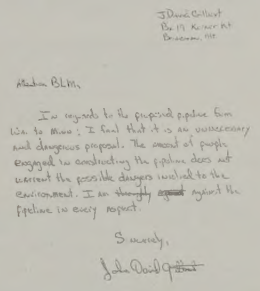
Dear BLM -

In regards to the proposed pipeline extending from wash to Minn, I feel the last thing our state needs is an oil pipeline The increadable costs don't justify the minimal amount of people that would be employed (putting how many truckers, & railroad people out of work?) Not to mention the environmental destruction that would occur during construction, & any oil spills from equipment failure and vandalism.

I am against any pipeline in Montana—

Box 19 Kenner Kourt
Bozeman, MT 59715

**7**



J David Gilbert
Box 19 Kenner Kt
Bozeman, MT

Attention BLM,

In regards to the proposed pipeline from Wa. to Minn; I feel that it is an unnecessary and dangerous proposal. The amount of people engaged in constructing the pipeline does not warrant the possible dangers involved to the environment. I am ~~thoroughly~~ ~~against~~ against the pipeline in every respect.

Sincerely,

John David Gilbert

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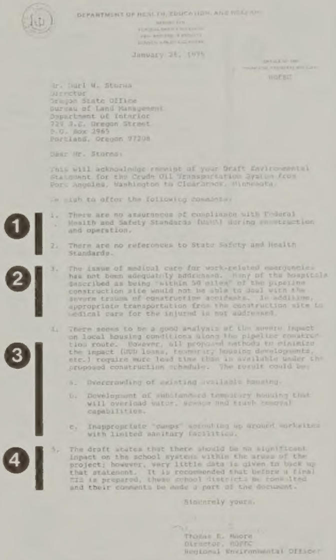
**8**



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

January 26, 1979

ROFEC

Mr. Murl W. Storms
Director
Oregon State Office
Bureau of Land Management
Department of Interior
729 N.E. Oregon Street
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Storms:

This will acknowledge receipt of your Draft Environmental Statement for the Crude Oil Transportation System from Port Angeles, Washington to Clearbrook, Minnesota.

We wish to offer the following comments:

① 1. There are no assurances of compliance with Federal Health and Safety Standards (OSHA) during construction and operation.

2. There are no references to State Safety and Health Standards.

② 3. The issue of medical care for work-related emergencies has not been adequately addressed. Many of the hospitals described as being "within 50 miles" of the pipeline construction site would not be able to deal with the severe trauma of construction accidents. In addition, appropriate transportation from the construction site to medical care for the injured is not addressed.

③ 4. There seems to be a good analysis of the severe impact on local housing conditions along the pipeline construction route. However, all proposed methods to minimize the impact (HUD loans, temporary housing developments, etc.) require more lead time than is available under the proposed construction schedule. The result could be:

a. Overcrowding of existing available housing.

b. Development of substandard temporary housing that will overload water, sewage and trash removal capabilities.

c. Inappropriate "camps" sprouting up around worksites with limited sanitary facilities.

④ 5. The draft states that there should be no significant impact on the school systems within the areas of the project; however, very little data is given to back up that statement. It is recommended that before a final EIS is prepared, these school districts be consulted and their comments be made a part of the document.

Sincerely yours,

Thomas E. Moore
Director, ROFEC
Regional Environmental Officer

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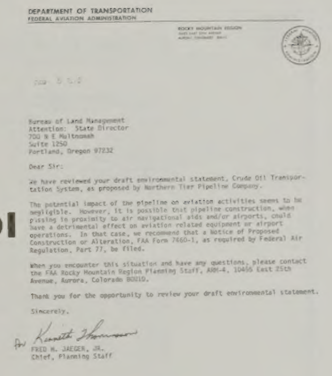
**10**



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

ROCKY MOUNTAIN REGION

FEB 5 1979

Bureau of Land Management
Attention: State Director
700 N E Multnomah
Suite 1250
Portland, Oregon 97232

Dear Sir:

We have reviewed your draft environmental statement, Crude Oil Transportation System, as proposed by Northern Tier Pipeline Company.

① The potential impact of the pipeline on aviation activities seems to be negligible. However, it is possible that pipeline construction, when passing in proximity to air navigational aids and/or airports, could have a detrimental effect on aviation related equipment or airport operations. In that case, we recommend that a Notice of Proposed Construction or Alteration, FAA Form 7460-1, as required by Federal Air Regulation, Part 77, be filed.

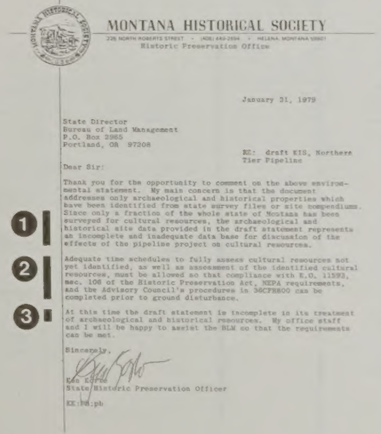
When you encounter this situation and have any questions, please contact the FAA Rocky Mountain Region Planning Staff, ARM-4, 10455 East 25th Avenue, Aurora, Colorado 80010.

Thank you for the opportunity to review your draft environmental statement.

Sincerely,

for Kenneth Thompson
FRED M. JAEGER, JR.
Chief, Planning Staff

**11**



MONTANA HISTORICAL SOCIETY
225 NORTH ROBERTS STREET • (406) 449-2694 • HELENA, MONTANA 59601
Historic Preservation Office

January 31, 1979

State Director
Bureau of Land Management
P.O. Box 2965
Portland, OR 97208

RE: draft EIS, Northern Tier Pipeline

Dear Sir:

① Thank you for the opportunity to comment on the above environmental statement. My main concern is that the document addresses only archaeological and historical properties which have been identified from state survey files or site compendiums. Since only a fraction of the whole state of Montana has been surveyed for cultural resources, the archaeological and historical site data provided in the draft statement represents an incomplete and inadequate data base for discussion of the effects of the pipeline project on cultural resources.

② Adequate time schedules to fully assess cultural resources not yet identified, as well as assessment of the identified cultural resources, must be allowed so that compliance with E.O. 11593, sec. 106 of the Historic Preservation Act, NEPA requirements, and the Advisory Council's procedures in 36CFR800 can be completed prior to ground disturbance.

③ At this time the draft statement is incomplete in its treatment of archaeological and historical resources. My office staff and I will be happy to assist the BLM so that the requirements can be met.

Sincerely,

Ken Korte
State Historic Preservation Officer

KK:PB:pb

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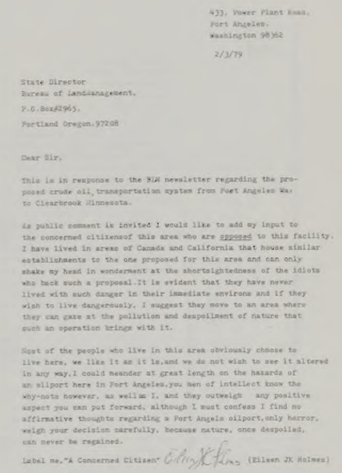
**12**



433, Power Plant Road,
Port Angeles.
Washington 98362

2/3/79

State Director
Bureau of LandManagement,
P.O.Box#2965.
Portland Oregon.97208

Dear Sir,

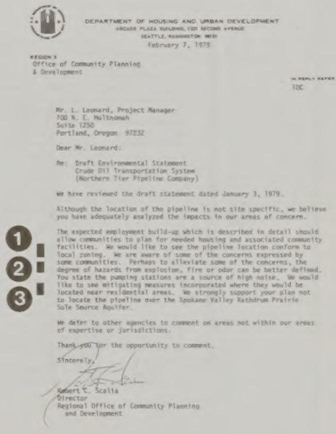
This is in response to the BLM newsletter regarding the proposed crude oil, transportation system from Port Angeles Wa. to Clearbrook Minnesota.

As public comment is invited I would like to add my input to the concerned citizensof this area who are opposed to this facility. I have lived in areas of Canada and California that house similar establishments to the one proposed for this area and can only shake my head in wonderment at the shortsightedness of the idiots who back such a proposal.It is evident that they have never lived with such danger in their immediate environs and if they wish to live dangerously, I suggest they move to an area where they can gaze at the pollution and despoilment of nature that such an operation brings with it.

Most of the people who live in this area obviously choose to live here, we like it as it is,and we do not wish to see it altered in any way.I could meander at great length on the hazards of an oilport here in Port Angeles,you men of intellect know the why-nots however, as well as I, and they outweigh any positive aspect you can put forward, although I must confess I find no affirmative thoughts regarding a Port Angels oilport,only horror, weigh your decision carefully, because nature, once despoiled, can never be regained.

Label me,"A Concerned Citizen" Eileen JK Holmes (Eileen JK Holmes)

**13**



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
ARCADE PLAZA BUILDING, 1321 SECOND AVENUE
SEATTLE, WASHINGTON 98101

February 7, 1979

REGION X
Office of Community Planning
& Development

IN REPLY REFER TO:
10C

Mr. L. Leonard, Project Manager
700 N. E. Multnomah
Suite 1250
Portland, Oregon 97232

Dear Mr. Leonard:

Re: Draft Environmental Statement
Crude Oil Transportation System
(Northern Tier Pipeline Company)

We have reviewed the draft statement dated January 3, 1979.

Although the location of the pipeline is not site specific, we believe you have adequately analyzed the impacts in our areas of concern.

① The expected employment build-up which is described in detail should allow communities to plan for needed housing and associated community facilities. We would like to see the pipeline location conform to local zoning. ② We are aware of some of the concerns expressed by some communities. Perhaps to alleviate some of the concerns, the degree of hazards from explosion, fire or odor can be better defined. ③ You state the pumping stations are a source of high noise. We would like to see mitigating measures incorporated where they would be located near residential areas. We strongly support your plan not to locate the pipeline over the Spokane Valley Rathdrum Prairie Sole Source Aquifer.

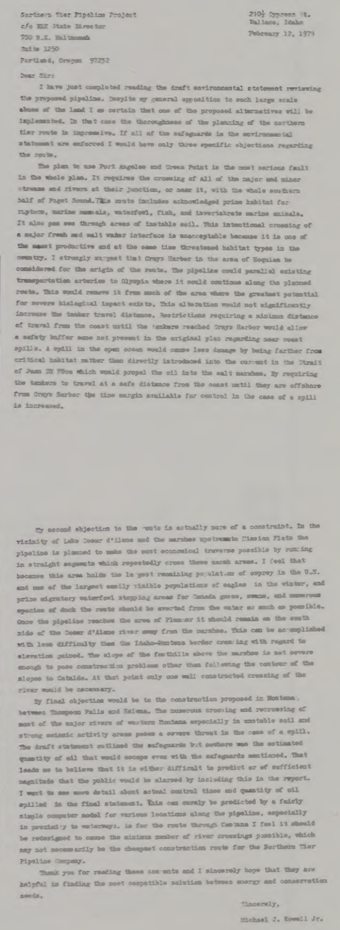
We defer to other agencies to comment on areas not within our areas of expertise or jurisdictions.

Thank you for the opportunity to comment.

Sincerely,

Robert C. Scalia
Director
Regional Office of Community Planning
and Development

14



Northern Tier Pipeline Project
c/o BLM State Director
700 N.E. Multnomah
Suite 1250
Portland, Oregon 97232

210½ Cypress St.
Wallace, Idaho
February 12, 1979

Dear Sir:

I have just completed reading the draft environmental statement reviewing the proposed pipeline. Despite my general opposition to such large scale abuse of the land I am certain that one of the proposed alternatives will be implemented. In that case the thoroughness of the planning of the northern tier route is impressive. If all of the safeguards in the environmental statement are enforced I would have only three specific objections regarding the route.

The plan to use Port Angeles and Green Point is the most serious fault in the whole plan. It requires the crossing of all of the major and minor streams and rivers at their junction, or near it, with the whole southern half of Puget Sound. This route includes acknowledged prime habitat for raptors, marine mammals, waterfowl, fish, and invertebrate marine animals. It also passes through areas of instable soil. This intentional crossing of a major fresh and salt water interface is unacceptable because it is one of the most productive and at the same time threatened habitat types in the

① country. I strongly suggest that Grays Harbor in the area of Hoquiam be considered for the origin of the route. The pipeline could parallel existing transportation arteries to Olympia where it could continue along the planned route. This would remove it from much of the area where the greatest potential for severe biological impact exists. This alteration would not significantly increase the tanker travel distance. Restrictions requiring a minimum distance of travel from the coast until the tankers reached Grays Harbor would allow a safety buffer zone not present in the original plan regarding near coast spills. A spill in the open ocean would cause less damage by being farther from critical habitat rather than directly introduced into the current in the Strait of Juan DE Fuca which would propel the oil into the salt marshes. By requiring the tankers to travel at a safe distance from the coast until they are offshore from Grays Harbor the time margin available for control in the case of a spill is increased.

② My second objection to the route is actually more of a constraint. In the vicinity of Lake Coeur d'Alene and the marshes upstream to Mission Flats the pipeline is planned to make the most economical traverse possible by running in straight segments which repeatedly cross these marsh areas. I feel that because this area holds the largest remaining population of osprey in the U.S. and one of the largest easily visible populations of eagles in the winter, and prime migratory waterfowl stopping areas for Canada geese, swans, and numerous species of duck the route should be averted from the water as much as possible. Once the pipeline reaches the area of Plummer it should remain on the south side of the Coeur d'Alene river away from the marshes. This can be accomplished with less difficulty than the Idaho-Montana border crossing with regard to elevation gained. The slope of the foothills above the marshes is not severe enough to pose construction problems other than following the contour of the slopes to Cataldo. At that point only one well constructed crossing of the river would be necessary.

③ My final objection would be to the construction proposed in Montana between Thompson Falls and Helena. The numerous crossing and recrossing of most of the major rivers of western Montana especially in unstable soil and strong seismic activity areas poses a severe threat in the case of a spill. The draft statement outlined the safeguards but nowhere was the estimated quantity of oil that would escape even with the safeguards mentioned. That leads me to believe that it is either difficult to predict or of sufficient magnitude that the public would be alarmed by including this in the report. I want to see more detail about actual control times and quantity of oil spilled in the final statement. This can surely be predicted by a fairly simple computer model for various locations along the pipeline, especially in proximity to waterways. As for the route through Montana I feel it should be redesigned to cause the minimum number of river crossings possible, which may not necessarily be the cheapest construction route for the Northern Tier Pipeline Company.

Thank you for reading these comments and I sincerely hope that they are helpful in finding the most compatible solution between energy and conservation needs.

Sincerely,

Michael J. Howell Jr.

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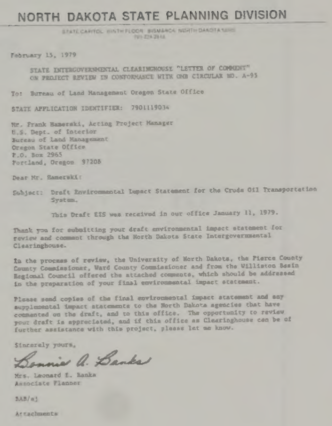
15



# NORTH DAKOTA STATE PLANNING DIVISION

STATE CAPITOL NINTH FLOOR BISMARCK NORTH DAKOTA 58505
701-224-2818

February 15, 1979

STATE INTERGOVERNMENTAL CLEARINGHOUSE "LETTER OF COMMENT"
ON PROJECT REVIEW IN CONFORMANCE WITH OMB CIRCULAR NO. A-95

To: Bureau of Land Management Oregon State Office

STATE APPLICATION IDENTIFIER: 7901119034

Mr. Frank Hamerski, Acting Project Manager
U.S. Dept. of Interior
Bureau of Land Management
Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Hamerski:

Subject: Draft Environmental Impact Statement for the Crude Oil Transportation System.

This Draft EIS was received in our office January 11, 1979.

Thank you for submitting your draft environmental impact statement for review and comment through the North Dakota State Intergovernmental Clearinghouse.

In the process of review, the University of North Dakota, the Pierce County County Commissioner, Ward County Commissioner and from the Williston Basin Regional Council offered the attached comments, which should be addressed in the preparation of your final environmental impact statement.

Please send copies of the final environmental impact statement and any supplemental impact statements to the North Dakota agencies that have commented on the draft, and to this office. The opportunity to review your draft is appreciated, and if this office as Clearinghouse can be of further assistance with this project, please let me know.

Sincerely yours,

Bonnie A. Banks

Mrs. Leonard E. Banks
Associate Planner

BAB/aj

Attachments

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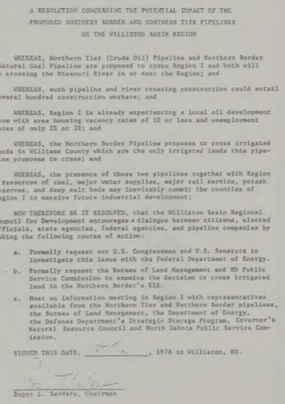
A



① A RESOLUTION CONCERNING THE POTENTIAL IMPACT OF THE PROPOSED NORTHERN BORDER AND NORTHERN TIER PIPELINES ON THE WILLISTON BASIN REGION

WHEREAS, Northern Tier (Crude Oil) Pipeline and Northern Border (Natural Gas) Pipeline are proposed to cross Region I and both will be crossing the Missouri River in or near the Region; and

WHEREAS, such pipeline and river crossing construction could entail several hundred construction workers; and

WHEREAS, Region I is already experiencing a local oil development boom with area housing vacancy rates of 1% or less and unemployment rates of only 2% or 3%; and

WHEREAS, the Northern Border Pipeline proposes to cross irrigated lands in Williams County which are the only irrigated lands this pipeline proposes to cross; and

WHEREAS, the presence of these two pipelines together with Region I resources of coal, major water supplies, major rail service, potash reserves, and deep salt beds may inevitably commit the counties of Region I to massive future industrial development;

NOW THEREFORE BE IT RESOLVED, that the Williston Basin Regional Council for Development encourages a dialogue between citizens, elected officials, state agencies, federal agencies, and pipeline companies by taking the following course of action:

a. Formally request our U.S. Congressman and U.S. Senators to investigate this issue with the Federal Department of Energy.
b. Formally request the Bureau of Land Management and ND Public Service Commission to examine the decision to cross irrigated land in the Northern Border's EIS.
c. Host an information meeting in Region I with representatives available from the Northern Tier and Northern Border pipelines, the Bureau of Land Management, the Department of Energy, the Defense Department's Strategic Storage Program, Governor's Natural Resource Council and North Dakota Public Service Commission.

SIGNED THIS DATE, ____________, 1978 in Williston, ND.

Roger L. Sanders, Chairman

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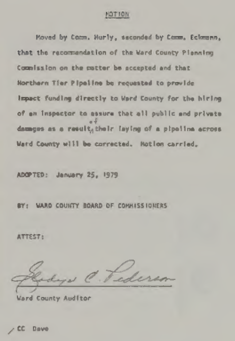
B



MOTION

① Moved by Comm. Hurly, seconded by Comm. Eckmann, that the recommendation of the Ward County Planning Commission on the matter be accepted and that Northern Tier Pipeline be requested to provide impact funding directly to Ward County for the hiring of an inspector to assure that all public and private damages as a result of their laying of a pipeline across Ward County will be corrected. Motion carried.

ADOPTED: January 25, 1979

BY: WARD COUNTY BOARD OF COMMISSIONERS

ATTEST:

Gladys C. Pederson

Ward County Auditor

CC Dave

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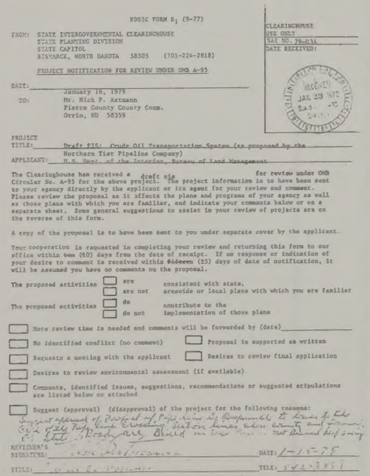
C



NDSIC FORM $8_1$ (9-77)

FROM: STATE INTERGOVERNMENTAL CLEARINGHOUSE
STATE PLANNING DIVISION
STATE CAPITOL
BISMARCK, NORTH DAKOTA 58505 (701-224-2818)

PROJECT NOTIFICATION FOR REVIEW UNDER OMB A-95

CLEARINGHOUSE USE ONLY
SAI NO. 79-036
DATE RECEIVED:

RECEIVED
JAN 23 1979

DATE: January 16, 1979
TO: Mr. Nick P. Axtmann
Pierce County County Comm.
Orrin, ND 58359

PROJECT TITLE: Draft EIS: Crude Oil Transportation System (as proposed by the Northern Tier Pipeline Company)
APPLICANT: U.S. Dept. of the Interior, Bureau of Land Management

The Clearinghouse has received a draft eis for review under OMB Circular No. A-95 for the above project. The project information is to have been sent to your agency directly by the applicant or its agent for your review and comment. Please review the proposal as it affects the plans and programs of your agency as well as those plans with which you are familiar, and indicate your comments below or on a separate sheet. Some general suggestions to assist in your review of projects are on the reverse of this form.

A copy of the proposal is to have been sent to you under separate cover by the applicant.

Your cooperation is requested in completing your review and returning this form to our office within ~~ten~~ (40) days from the date of receipt. If no response or indication of your desire to comment is received within ~~fifteen~~ (15) days of date of notification, it will be assumed you have no comments on the proposal.

The proposed activities ☐ are ☐ are not consistent with state, areawide or local plans with which you are familiar

The proposed activities ☐ do ☐ do not contribute to the implementation of those plans

☐ More review time is needed and comments will be forwarded by (date)____________

☐ No identified conflict (no comment)    ☐ Proposal is supported as written

☐ Requests a meeting with the applicant    ☐ Desires to review final application

☐ Desires to review environmental assessment (if available)

☐ Comments, identified issues, suggestions, recommendations or suggested stipulations are listed below or attached

☐ Suggest (approval) (disapproval) of the project for the following reasons:

Suggest approval of Project if Pipe line is Responsible to [illegible] State Roads are Build [illegible]

REVIEWER'S SIGNATURE: [illegible]    DATE: 1-15-79

TITLE: [illegible]    TELE: [illegible]

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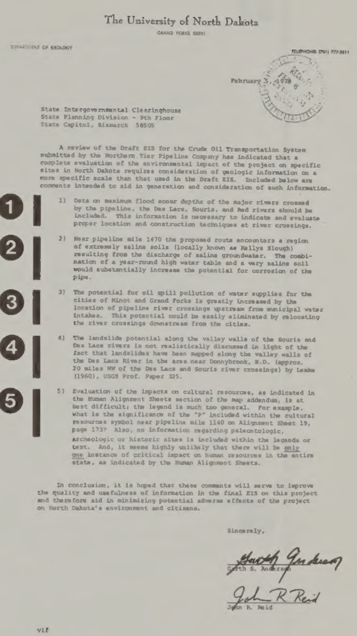
D



The University of North Dakota
GRAND FORKS 58201

DEPARTMENT OF GEOLOGY

TELEPHONE (701) 777-2411

February 5, 1979

RECEIVED
FEB 8

State Intergovernmental Clearinghouse
State Planning Division - 9th Floor
State Capitol, Bismarck 58505

A review of the Draft EIS for the Crude Oil Transportation System submitted by the Northern Tier Pipeline Company has indicated that a complete evaluation of the environmental impact of the project on specific sites in North Dakota requires consideration of geologic information on a more specific scale than that used in the Draft EIS. Included below are comments intended to aid in generation and consideration of such information.

① 1) Data on maximum flood scour depths of the major rivers crossed by the pipeline, the Des Lacs, Souris, and Red rivers should be included. This information is necessary to indicate and evaluate proper location and construction techniques at river crossings.

② 2) Near pipeline mile 1470 the proposed route encounters a region of extremely saline soils (locally known as Kellys Slough) resulting from the discharge of saline groundwater. The combination of a year-round high water table and a very saline soil would substantially increase the potential for corrosion of the pipe.

③ 3) The potential for oil spill pollution of water supplies for the cities of Minot and Grand Forks is greatly increased by the location of pipeline river crossings upstream from municipal water intakes. This potential could be easily eliminated by relocating the river crossings downstream from the cities.

④ 4) The landslide potential along the valley walls of the Souris and Des Lacs rivers is not realistically discussed in light of the fact that landslides have been mapped along the valley walls of the Des Lacs River in the area near Donnybrook, N.D. (approx. 20 miles NW of the Des Lacs and Souris river crossings) by Lemke (1960), USGS Prof. Paper 325.

⑤ 5) Evaluation of the impacts on cultural resources, as indicated in the Human Alignment Sheets section of the map addendum, is at best difficult; the legend is much too general. For example, what is the significance of the "P" included within the cultural resources symbol near pipeline mile 1140 on Alignment Sheet 19, page 173? Also, no information regarding paleontologic, archeologic or historic sites is included within the legends or text. And, it seems highly unlikely that there will be only one instance of critical impact on human resources in the entire state, as indicated by the Human Alignment Sheets.

In conclusion, it is hoped that these comments will serve to improve the quality and usefulness of information in the final EIS on this project and therefore aid in minimizing potential adverse effects of the project on North Dakota's environment and citizens.

Sincerely,

Garth Anderson
Garth S. Anderson

John R Reid
John R. Reid

vlf

**16**

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to
COMMANDER (mep)
Ninth Coast Guard District
1240 East 9th St.
Cleveland, Ohio 44199
Phone: 216-522-3919

16475

State Director
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Re: Draft Environmental Statement
Crude Oil Transportation System
Port Angels Washington to
Clearbrook, Minnesota

Dear Sir:

The referenced Statement has been reviewed by this office and we have no comments or objections to offer at this time.

Sincerely,

R. L. ANDREWS
Commander, U. S. Coast Guard
Water Resources Planning Officer
By direction of the Commander,
Ninth Coast Guard District

Copy to:
Thirteenth Coast Guard District (dpl)

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**17**

NORTH DAKOTA STATE PLANNING DIVISION
STATE CAPITOL · NINTH FLOOR · BISMARCK, NORTH DAKOTA 58505
701 224-2818

February 21, 1979

STATE INTERGOVERNMENTAL CLEARINGHOUSE SUPPLEMENTARY "LETTER OF COMMENT"
ON PROJECT REVIEW IN CONFORMANCE WITH OMB CIRCULAR NO. A-95

To: Bureau of Land Management Oregon State Office

STATE APPLICATION IDENTIFIER: 7901119034

Mr. Frank Hameraki, Acting Project Manager
U.S. Dept. of Interior
Bureau of Land Management
Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Hameraki:

Subject: DraftEnvironmental Impact Statement for the Crude Oil Transportation System.

This Draft EIS was received in our office January 11, 1979.

The above referenced Draft EIS has been reviewed through the North Dakota State Intergovernmental Clearinghouse in compliance with Office of Management and Budget Circular No. A-95 and/or North Dakota Executive Order No. 48. Previous comments were forwarded to you with a "Letter of Comment", dated February 15, 1979.

Since then, additional comments have been received from the City of Grand Forks and from the Governor's Office.

This letter and the attached comments constitute the further comment of the State Intergovernmental Clearinghouse. To further document your compliance with Office of Management and Budget Circular No. A-95, this letter, the attached comments and your response to those comments should be made a part of your application or development proposal.

Please use the above SAI number for reference to the above project with this office. Your continued cooperation in the review process is much appreciated.

Sincerely yours,

Bonnie A. Banks

Mrs. Leonard E. Banks
Associate Planner

BAB/aj

Attachment

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**A**

NDSIC FORM B, (9-77)

FROM: STATE INTERGOVERNMENTAL CLEARINGHOUSE
STATE PLANNING DIVISION
STATE CAPITOL
BISMARCK, NORTH DAKOTA 58505 (701-224-2818)

CLEARINGHOUSE
USE ONLY
SAI NO. 79-034
DATE RECEIVED:
FEB 20

PROJECT NOTIFICATION FOR REVIEW UNDER OMB A-95

DATE: January 16, 1979

TO: Gov. Arthur Link
Governor's Office
State Capitol
Bismarck, ND 58505

PROJECT TITLE: Draft EIS: Crude Oil Transportation System (as proposed by the Northern Tier Pipeline Company)

APPLICANT: U.S. Dept. of the Interior, Bureau of Land Management

The Clearinghouse has received a draft eis for review under OMB Circular No. A-95 for the above project. The project information is to have been sent to your agency directly by the applicant or its agent for your review and comment. Please review the proposal as it affects the plans and programs of your agency as well as those plans with which you are familiar, and indicate your comments below or on a separate sheet. Some general suggestions to assist in your review of projects are on the reverse of this form.

A copy of the proposal is to have been sent to you under separate cover by the applicant.

Your cooperation is requested in completing your review and returning this form to our office within ~~ten~~ (40) days from the date of receipt. If no response or indication of your desire to comment is received within ~~fifteen~~ (15) days of date of notification, it will be assumed you have no comments on the proposal.

The proposed activities ☒ are ☐ are not consistent with state, areawide or local plans with which you are familiar

The proposed activities ☒ do ☐ do not contribute to the implementation of those plans

☐ More review time is needed and comments will be forwarded by (date) ____

☐ No identified conflict (no comment) ☒ Proposal is supported as written

☐ Requests a meeting with the applicant ☐ Desires to review final application

☐ Desires to review environmental assessment (if available)

☐ Comments, identified issues, suggestions, recommendations or suggested stipulations are listed below or attached

☒ Suggest [✓ (approval)] (disapproval) of the project for the following reasons:
[illegible]

REVIEWER'S SIGNATURE: [illegible] DATE: 2/10/79

TITLE: [illegible] TELE: [illegible]

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**B**

CITY OF GRAND FORKS
GRAND FORKS, NORTH DAKOTA 58201
CITY PLANNING & ZONING COMMISSION

February 13, 1979

North Dakota Public Service Commission
State Capitol Bldg.
Bismarck, ND 58505

Gentlemen:

① Enclosed find a copy of the minutes of the Grand Forks Planning and Zoning Commission meeting held on February 7, 1979, at which time the Commission took action requesting that the Northern Tier Pipeline Company move its proposed Red River crossing so that it passes north of Grand Forks.

The City of Grand Forks makes this request because of the problems involved in the probability of an oil spill, regardless of how slight, getting into the water supply of the City.

Mr. Don Wilson and Mr. Steve Shores, the Butler Associates representatives, were in attendance and stated that crossing major rivers is very important criteria in selecting the route of the proposed pipeline.

Following the Butler Associates presentation, planning and zoning commission members and citizens in attendance expressed concern about the pipelines proposed route south of Grand Forks. Local concern centered on the possibility of an oil spill affecting the water supply for the City. It was strongly recommended by those in attendance that the Northern Tier Pipeline route be moved north of Grand Forks. Staff of the Grand Forks City Engineering Department gave a presentation that illustrated alternative pipeline routes that could be utilized if a north route decision were implemented. (See Exhibit A)

Other factors which reinforced the north route follows: (1) If the route were north of Grand Forks, it would not be impacting as much agricultural lands that are classified as prime agricultural land. (See Exhibits B and C enclosed (i.e. Soil Classifications and Soil Salinity)). (2) It was pointed out by Butler Associates that it is very important to Northern Tier Pipeline Company that the number of major river crossings be kept to a minimum, and the north route would eliminate one river crossing on the Red Lake River in Minnesota. (See Exhibit D)

In conclusion, there are important reasons for rerouting the Northern Tier Pipeline to the north of the City of Grand Forks. First, if the pipeline was north of the community and an oil spill did occur, the water supply of both Grand Forks and East Grand Forks would not be jeopardized (current metropolitan population of 52,000 people). Second, if the pipeline were routed north less prime agricultural land would be affected. Third, if the

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**CONT**

Public Service Commission -2- February 13, 1979

pipeline were to run north of the City, one major river crossing on the Red Lake River in Minnesota could be eliminated.

The City of Grand Forks expresses its thanks for being heard and adamantly opposes the pipeline crossing south of Grand Forks, North Dakota.

Very truly yours,

Frank B. Orthmeyer

Frank B. Orthmeyer
Secretary

FBO/mb
Enclosures
CC: St. Paul Dist. Corps of Eng.-1135 U.S. Post Office & Custom House-
St. Paul, MN 55101- Dave Parsons, General Regulatory Branch
Ken Kadlec, Permit Section
Northern Tier Pipeline Co.-509 Midland Natl. Bank Bldg.-Billings, MT 59101
Bonnie Banks, State Planning Division-9th Floor-Cap. Bldg.-Bismarck, ND 58505
Jim Hodge-1218 3rd Avenue-Suite 1800-Seattle, WA 98101
Ralph Sandmeyer-Suite 600-4815 South Harvard-Tulsa, OK 74135
Mayor C. P. O'Neill
Clifford Thomforde, Chairman of the Planning Commission
Robert Bushfield, City Planner

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P. C. PROCEEDINGS -4- February 7, 1979

Commission members, which included the Background Studies, the Land Use Plan, and the Implementation Program. He outlined the entire plan for the members pointing out areas covered in it. Discussion followed Mr. Ulland's presentation. Mr. Orthmeyer complimented the staff for the excellent plan and report. It was agreed by the members present that they study the plan and discuss it further at the March meeting.

NORTHERN TIER PIPELINE COMPANY PRESENTATION ON CRUDE OIL PIPELINE CROSSING IN NORTH DAKOTA

Attorney John Shaft introduced two gentlemen, Don Wilson and Steve Shores, who were present to represent Butler Associates and the Northern Tier Pipeline Company. Butler Associates is one of seven companies which compose Northern Tier Pipeline Company. Mr. Shores gave a brief history of the Northern Tier Pipeline Company and also facts about the pipeline which will stretch from Washington to Clearbrook, Minnesota, stating that the pipeline will travel 344 miles across the state of North Dakota crossing south of Grand Forks. Don Wilson followed with a slide presentation of a pipeline crossing in North Carolina. Following the presentation, there was much discussion. Several people questioned whether Northern Tier Pipeline Co. would consider rerouting the pipeline north of the city. Mr. Orthmeyer asked the representatives of Northern Tier Pipeline Co. to consider rerouting the proposed pipeline North of Grand Forks in order to avoid the possibility of an oil spill into the City water intakes. He used a map illustrating alternative routes, marked Exhibit A. Mr. Shores and Mr. Wilson suggested that the Public Service Commission and the Corps of Engineers be advised of this concern and added that the City of Grand Forks will be notified of the decision that is reached by the company. After further discussion, a motion was made by Mr. Polovitz and seconded by Mr. Malm that we recommend to the Public Service Commission that the pipeline crossing be north of the city. The motion carried. (Exhibit A was sent to the Public Service Commission.)

ADJOURNMENT

A motion was made by Mr. Malm and seconded by Mr. Polovitz that we adjourn until March 7, 1979. The motion carried.

Respectfully submitted,

Frank B. Orthmeyer

Frank B. Orthmeyer, Secretary

C. J. Thomforde, Chairman

FBO/mb

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**18**

Gentlemen,

I do not feel that the "Draft Environmental Impact Statement" on the Northern Tier Pipeline completely addresses the impacts on the environment, or explores enough alternatives.

Some major areas of concern:

① 1. Cannot a way be found to cross rivers on a bridgework or suspension system to eliminate the disturbing of the stream channel? This is especially important in such pristine rivers such as those found on the Olympic Peninsula and Hood Canal regions.

② 2. Why isn't a pipeline proposed from the unloading facilities to the tank storage via a land route? This would have less chance of leaking into the harbor and the Strait of Juan de Fuca and potentially be cheaper.

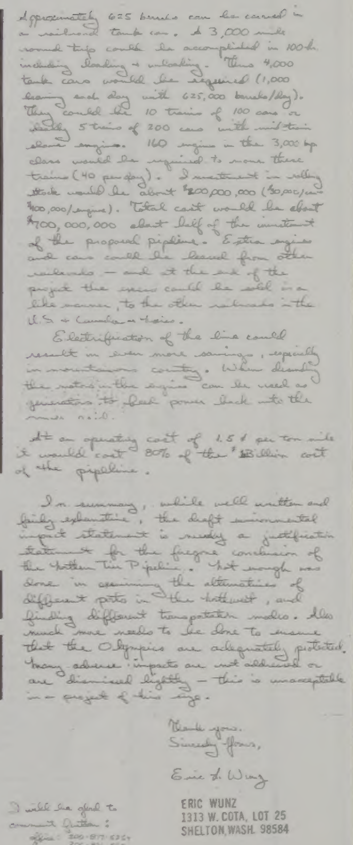
③ 3. Why the "wedge" cut for the pipeline at Green Point? You don't see that on other pipelines traversing rough terrain.

④ 4. We are experiencing some minor electrical power shortages this winter, and the rapidly increasing population of the NorthWest isn't helping. Where is the additional power for the electric pumps coming from? The NorthWest has virtually run out of additional hydroelectric sites, and the nuclear plants are in political + economic trouble.

⑤ 5. Why unload the oil at Port Angeles and pipe it the length of the Olympic Peninsula? It looks to me that Grays Harbor + Aberdeen would have been more logical economically. Also the Olympics are uniquely pristine and even the slightest degradation would have noticeable effect.

⑥ 6. Since the pipeline parallels existing rail lines for much of its length why not explore that alternative. The "Milwaukee Railroad" is in economic trouble and the line could probably be bought for $500 million — scrap value. An Aberdeen — Clearbrook railline would involve little additional impact because the right-of-way is already in place.

CONT



6 Approximately 625 barrels can be carried in a railroad tank car. A 3,000 mile round trip could be accomplished in 100 hr including loading + unloading. Thus 4,000 tank cars would be required (1,000 leaving each day with 625,000 barrels/day). They could be 10 trains of 100 cars or ideally 5 trains of 200 cars with mid-train slave engines. 160 engines in the 3,000 hp class would be required to move these trains (40 per day). Investment in rolling stock would be about $200,000,000 ($30,000/car $400,000/engine). Total cost would be about $700,000,000 about half of the investment of the proposed pipeline. Extra engines and cars could be leased from other railroads — and at the end of the project the excess could be sold in a like manner, to the other railroads in the U.S. + Canada [illegible].

Electrification of the line could result in even more savings, especially in mountainous country. When descending the motors in the engines can be used as generators to feed power back into the power grid.

At an operating cost of 1.5¢ per ton mile it would cost 80% of the $Billion cost of the pipeline.

In summary, while well written and fairly exhaustive, the draft environmental impact statement is merely a justification statement for the foregone conclusion of the Northern Tier Pipeline. 7 Not enough was done in examining the alternatives of different ports in the Northwest, and finding different transportation modes. 8 Also much more needs to be done to ensure that the Olympics are adequately protected. Many adverse impacts are not addressed or are dismissed lightly — this is unacceptable in a project of this size.

Thank you.
Sincerely Yours,

Eric A. Wunz

ERIC WUNZ
1313 W. COTA, LOT 25
SHELTON, WASH. 98584

I will be glad to comment further:
office: 206-877-5254
[illegible]

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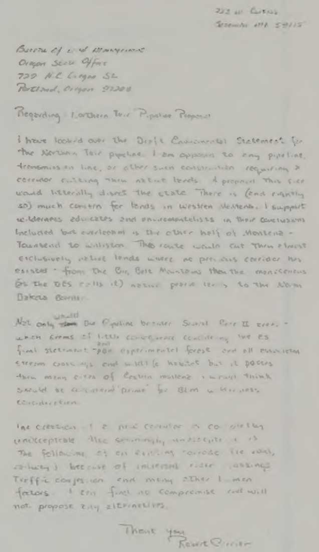
19



223 W. Curtiss
Bozeman MT 59715

Bureau of Land Management
Oregon State Office
729 N.E. Oregon St.
Portland, Oregon 97208

Regarding: Northern Tier Pipeline Proposal

I have looked over the Draft Environmental Statement for the Northern Tier pipeline. I am opposed to any pipeline, transmission line, or other such construction requiring a corridor cutting thru native lands. A proposal this size would literally dissect the state. There is (and rightly so) much concern for lands in western Montana. I support wilderness advocates and environmentalists in their conclusions. Included but overlooked is the other half of Montana - Townsend to Williston. This route would cut thru almost exclusively native lands where no previous corridor has existed - from the Big Belt Mountains thru the monocline (as the DES calls it) native prairie lands to the North Dakota Border.

Not only ~~then~~ would the Pipeline border Special Care II areas - which seems of little consequence considering the ES final statement - ~~PBR~~ and experimental forest and all municipal stream crossings and wildlife habitat but it passes thru many areas of eastern Montana I would think should be considered 'prime' for BLM wilderness consideration.

The creation of a new corridor is completely unacceptable. The seemingly [illegible] is the following of an existing corridor (ie road, railway) because of increased river crossings, traffic congestion and many other human factors. I can find no compromise and will not propose any alternatives.

Thank you
Robert [illegible]

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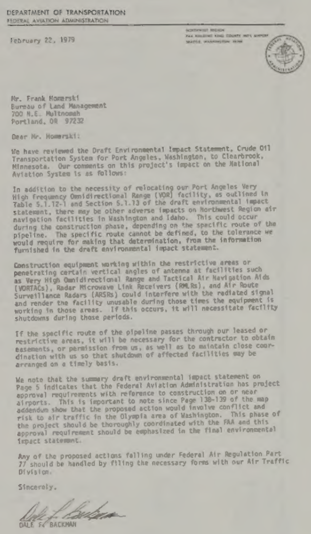

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

February 22, 1979

Mr. Frank Homerski
Bureau of Land Management
700 N.E. Multnomah
Portland, OR 97232

Dear Mr. Homerski:

We have reviewed the Draft Environmental Impact Statement, Crude Oil Transportation System for Port Angeles, Washington, to Clearbrook, Minnesota. Our comments on this project's impact on the National Aviation System is as follows:

In addition to the necessity of relocating our Port Angeles Very High Frequency Omnidirectional Range (VOR) facility, as outlined in Table 5.1.12-1 and Section 5.1.13 of the draft environmental impact statement, 1 there may be other adverse impacts on Northwest Region air navigation facilities in Washington and Idaho. This could occur during the construction phase, depending on the specific route of the pipeline. The specific route cannot be defined, to the tolerance we would require for making that determination, from the information furnished in the draft environmental impact statement.

Construction equipment working within the restrictive areas or penetrating certain vertical angles of antenna at facilities such as Very High Omnidirectional Range and Tactical Air Navigation Aids (VORTACs), Radar Microwave Link Receivers (RMLRs), and Air Route Surveillance Radars (ARSRs) could interfere with the radiated signal and render the facility unusable during those times the equipment is working in those areas. If this occurs, it will necessitate facility shutdowns during those periods.

If the specific route of the pipeline passes through our leased or restrictive areas, it will be necessary for the contractor to obtain easements, or permission from us, as well as to maintain close coordination with us so that shutdown of affected facilities may be arranged on a timely basis.

We note that the summary draft environmental impact statement on Page 5 indicates that the Federal Aviation Administration has project approval requirements with reference to construction on or near airports. This is important to note since Page 138-139 of the map addendum show that the proposed action would involve conflict and risk to air traffic in the Olympia area of Washington. This phase of the project should be thoroughly coordinated with the FAA and this approval requirement should be emphasized in the final environmental impact statement.

Any of the proposed actions falling under Federal Air Regulation Part 77 should be handled by filing the necessary forms with our Air Traffic Division.

Sincerely,

Dale F. Backman
DALE F. BACKMAN

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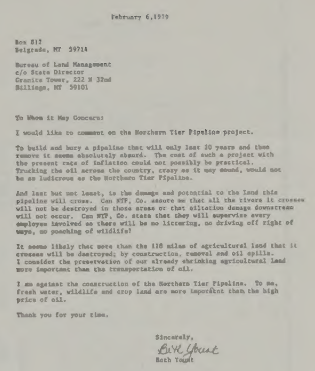
21



February 6,1979

Box 817
Belgrade, MT 59714

Bureau of Land Management
c/o State Director
Granite Tower, 222 N 32nd
Billings, MT 59101

To Whom it May Concern:

I would like to comment on the Northern Tier Pipeline project.

To build and bury a pipeline that will only last 20 years and then remove it seems absolutely absurd. The cost of such a project with the present rate of inflation could not possibly be practical. Trucking the oil across the country, crazy as it may sound, would not be as ludicrous as the Northern Tier Pipeline.

And last but not least, is the damage and potential to the land this pipeline will cross. Can NTP, Co. assure me that all the rivers it crosses will not be destroyed in those areas or that siltation damage downstream will not occur. Can NTP, Co. state that they will supervise every employee involved so there will be no littering, no driving off right of ways, no poaching of wildlife?

It seems likely that more than the 118 miles of agricultural land that it crosses will be destroyed; by construction, removal and oil spills. I consider the preservation of our already shrinking agricultural land more important than the transportation of oil.

I am against the construction of the Northern Tier Pipeline. To me, fresh water, wildlife and crop land are more important than the high price of oil.

Thank you for your time.

Sincerely,

Beth Youst
Beth Youst

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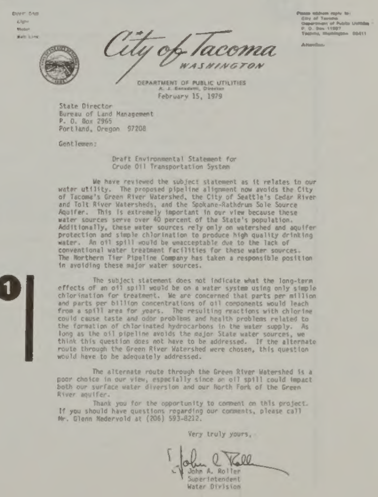
22



City of Tacoma
WASHINGTON

DEPARTMENT OF PUBLIC UTILITIES

February 15, 1979

State Director
Bureau of Land Management
P. O. Box 2965
Portland, Oregon 97208

Gentlemen:

Draft Environmental Statement for
Crude Oil Transportation System

We have reviewed the subject statement as it relates to our water utility. The proposed pipeline alignment now avoids the City of Tacoma's Green River Watershed, the City of Seattle's Cedar River and Tolt River Watersheds, and the Spokane-Rathdrum Sole Source Aquifer. This is extremely important in our view because these water sources serve over 40 percent of the State's population. Additionally, these water sources rely only on watershed and aquifer protection and simple chlorination to produce high quality drinking water. An oil spill would be unacceptable due to the lack of conventional water treatment facilities for these water sources. The Northern Tier Pipeline Company has taken a responsible position in avoiding these major water sources.

1 The subject statement does not indicate what the long-term effects of an oil spill would be on a water system using only simple chlorination for treatment. We are concerned that parts per million and parts per billion concentrations of oil components would leach from a spill area for years. The resulting reactions with chlorine could cause taste and odor problems and health problems related to the formation of chlorinated hydrocarbons in the water supply. As long as the oil pipeline avoids the major State water sources, we think this question does not have to be addressed. If the alternate route through the Green River Watershed were chosen, this question would have to be adequately addressed.

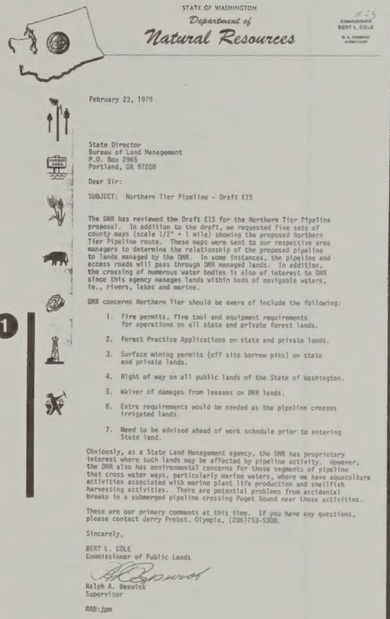
The alternate route through the Green River Watershed is a poor choice in our view, especially since an oil spill could impact both our surface water diversion and our North Fork of the Green River aquifer.

Thank you for the opportunity to comment on this project. If you should have questions regarding our comments, please call Mr. Glenn Medervold at (206) 593-8212.

Very truly yours,

John A. Roller
John A. Roller
Superintendent
Water Division

**23**



STATE OF WASHINGTON
Department of
Natural Resources

COMMISSIONER
BERT L. COLE

February 23, 1979

State Director
Bureau of Land Management
P.O. Box 2965
Portland, OR 97208

Dear Sir:

SUBJECT: Northern Tier Pipeline - Draft EIS

The DNR has reviewed the Draft EIS for the Northern Tier Pipeline proposal. In addition to the draft, we requested five sets of county maps (scale 1/2" = 1 mile) showing the proposed Northern Tier Pipeline route. These maps were sent to our respective area managers to determine the relationship of the proposed pipeline to lands managed by the DNR. In some instances, the pipeline and access roads will pass through DNR managed lands. In addition, the crossing of numerous water bodies is also of interest to DNR since this agency manages lands within beds of navigable waters, ie., rivers, lakes and marine.

DNR concerns Northern Tier should be aware of include the following:

①

1. Fire permits, fire tool and equipment requirements for operations on all state and private forest lands.
2. Forest Practice Applications on state and private lands.
3. Surface mining permits (off site borrow pits) on state and private lands.
4. Right of way on all public lands of the State of Washington.
5. Waiver of damages from leasees on DNR lands.
6. Extra requirements would be needed as the pipeline crosses irrigated lands.
7. Need to be advised ahead of work schedule prior to entering State land.

Obviously, as a State Land Management agency, the DNR has proprietary interest where such lands may be affected by pipeline activity. However, the DNR also has environmental concerns for those segments of pipeline that cross water ways, particularly marine waters, where we have aquaculture activities associated with marine plant life production and shellfish harvesting activities. There are potential problems from accidental breaks in a submerged pipeline crossing Puget Sound near those activities.

These are our primary comments at this time. If you have any questions, please contact Jerry Probst, Olympia, (206)753-5308.

Sincerely,

BERT L. COLE
Commissioner of Public Lands

Ralph A. Beswick
Supervisor

RAB:jpm

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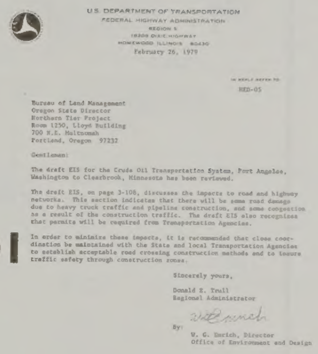
**24**



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION 5
18209 DIXIE HIGHWAY
HOMEWOOD ILLINOIS 60430

February 26, 1979

IN REPLY REFER TO:
HED-05

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Gentlemen:

The draft EIS for the Crude Oil Transportation System, Port Angeles, Washington to Clearbrook, Minnesota has been reviewed.

The draft EIS, on page 3-106, discusses the impacts to road and highway networks. This section indicates that there will be some road damage due to heavy truck traffic and pipeline construction, and some congestion as a result of the construction traffic. The draft EIS also recognizes that permits will be required from Transportation Agencies.

① In order to minimize these impacts, it is recommended that close coordination be maintained with the State and local Transportation Agencies to establish acceptable road crossing construction methods and to insure traffic safety through construction zones.

Sincerely yours,

Donald E. Trull
Regional Administrator

By:
W. G. Emrich, Director
Office of Environment and Design

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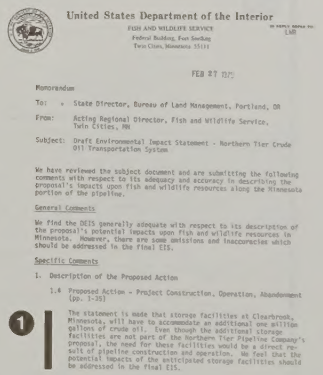
**25**



United States Department of the Interior
FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
LMR

FEB 27 1979

Memorandum

To: State Director, Bureau of Land Management, Portland, OR

From: Acting Regional Director, Fish and Wildlife Service, Twin Cities, MN

Subject: Draft Environmental Impact Statement - Northern Tier Crude Oil Transportation System

We have reviewed the subject document and are submitting the following comments with respect to its adequacy and accuracy in describing the proposal's impacts upon fish and wildlife resources along the Minnesota portion of the pipeline.

General Comments

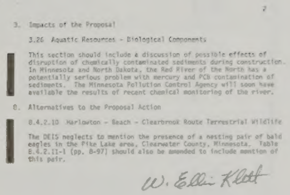
We find the DEIS generally adequate with respect to its description of the proposal's potential impacts upon fish and wildlife resources in Minnesota. However, there are some omissions and inaccuracies which should be addressed in the final EIS.

Specific Comments

1. Description of the Proposed Action

1.4 Proposed Action - Project Construction, Operation, Abandonment (pp. 1-35)

① The statement is made that storage facilities at Clearbrook, Minnesota, will have to accommodate an additional one million gallons of crude oil. Even though the additional storage facilities are not part of the Northern Tier Pipeline Company's proposal, the need for these facilities would be a direct result of pipeline construction and operation. We feel that the potential impacts of the anticipated storage facilities should be addressed in the final EIS.



2

3. Impacts of the Proposal

3.26 Aquatic Resources - Biological Components

② This section should include a discussion of possible effects of disruption of chemically contaminated sediments during construction. In Minnesota and North Dakota, the Red River of the North has a potentially serious problem with mercury and PCB contamination of sediments. The Minnesota Pollution Control Agency will soon have available the results of recent chemical monitoring of the river.

8. Alternatives to the Proposal Action

③ 8.4.2.10 Harlowton - Beach - Clearbrook Route Terrestrial Wildlife

The DEIS neglects to mention the presence of a nesting pair of bald eagles in the Pike Lake area, Clearwater County, Minnesota. Table 8.4.2.11-1 (pp. 8-97) should also be amended to include mention of this pair.

W. Ellis Klett

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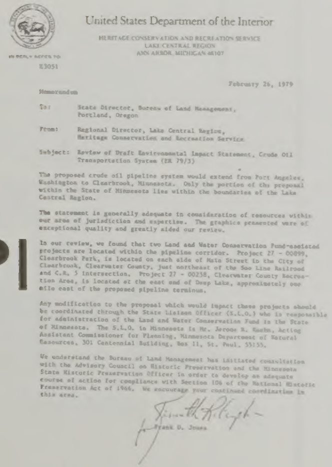
**26**



United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
LAKE CENTRAL REGION
ANN ARBOR, MICHIGAN 48107

IN REPLY REFER TO:
E3051

February 26, 1979

Memorandum

To: State Director, Bureau of Land Management, Portland, Oregon

From: Regional Director, Lake Central Region, Heritage Conservation and Recreation Service

Subject: Review of Draft Environmental Impact Statement, Crude Oil Transportation System (ER 79/3)

The proposed crude oil pipeline system would extend from Port Angeles, Washington to Clearbrook, Minnesota. Only the portion of the proposal within the State of Minnesota lies within the boundaries of the Lake Central Region.

The statement is generally adequate in consideration of resources within our area of jurisdiction and expertise. The graphics presented were of exceptional quality and greatly aided our review.

① In our review, we found that two Land and Water Conservation Fund-assisted projects are located within the pipeline corridor. Project 27 - 00099, Clearbrook Park, is located on each side of Main Street in the City of Clearbrook, Clearwater County, just northeast of the Soo Line Railroad and C.R. 5 intersection. Project 27 - 00238, Clearwater County Recreation Area, is located at the east end of Deep Lake, approximately one mile east of the proposed pipeline terminus.

Any modification to the proposal which would impact these projects should be coordinated through the State Liaison Officer (S.L.O.) who is responsible for administration of the Land and Water Conservation Fund in the State of Minnesota. The S.L.O. in Minnesota is Mr. Jerome H. Kuehn, Acting Assistant Commissioner for Planning, Minnesota Department of Natural Resources, 301 Centennial Building, Box 11, St. Paul, 55155.

We understand the Bureau of Land Management has initiated consultation with the Advisory Council on Historic Preservation and the Minnesota State Historic Preservation Officer in order to develop an adequate course of action for compliance with Section 106 of the National Historic Preservation Act of 1966. We encourage your continued coordination in this area.

for Frank D. Jones

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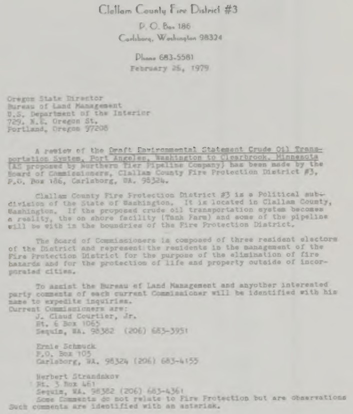
**27**



Clallam County Fire District #3
P. O. Box 186
Carlsborg, Washington 98324

Phone 683-5581

February 26, 1979

Oregon State Director
Bureau of Land Management
U.S. Department of the Interior
729, N.E. Oregon St.
Portland, Oregon 97208

A review of the Draft Environmental Statement Crude Oil Transportation System, Port Angeles, Washington to Clearbrook, Minnesota (AS proposed by Northern Tier Pipeline Company) has been made by the Board of Commissioners, Clallam County Fire Protection District #3, P.O. Box 186, Carlsborg, WA. 98324.

Clallam County Fire Protection District #3 is a Political subdivision of the State of Washington. It is located in Clallam County, Washington. If the proposed crude oil transportation system becomes a reality, the on shore facility (Tank Farm) and some of the pipeline will be with in the boundries of the Fire Protection District.

The Board of Commissioners is composed of three resident electors of the District and represent the residents in the management of the Fire Protection District for the purpose of the elimination of fire hazards and for the protection of life and property outside of incorporated cities.

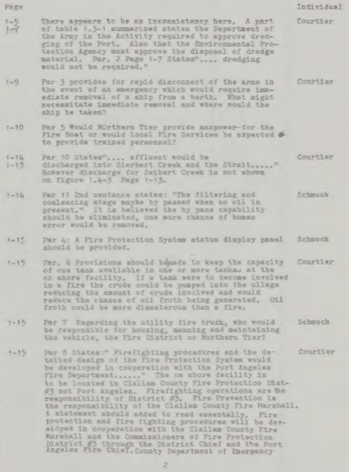
To assist the Bureau of Land Management and anyother interested party comments of each current Commissioner will be identified with his name to expedite inquiries.
Current Commissioners are:

J. Claud Courtier, Jr.
Rt. 6 Box 1065
Sequim, WA. 98382 (206) 683-3951

Ernie Schmuck
P.O. Box 105
Carlsborg, WA. 98324 (206) 683-4155

Herbert Strandskov
Rt. 3 Box 461
Sequim, WA. 98382 (206) 683-4361

Some Comments do not relate to Fire Protection but are Observations Such comments are identified with an asterisk.



| | Page | | Individual |
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| ① | 1-5<br>1-7 | There appears to be an inconsistancy here. A part of table 1.3-1 summarized states the Department of the Army is the Activity required to approve dredging of the Port. Also that the Environmental Protection Agency must approve the disposal of dredge material. Par. 2 Page 1-7 States".... dredging would not be required." | Courtier |
| ② | 1-9 | Par 3 provides for rapid disconnect of the arms in the event of an emergency which would require immediate removal of a ship from a berth. What might necessitate immediate removal and where would the ship be taken? | Courtier |
| ③ | 1-10 | Par 5 Would NOrthern Tier provide manpower for the Fire Boat or would local Fire Services be expected to provide trained personnel? | |
| ④ | 1-14<br>1-13 | Par 10 States".... affluent would be discharged into Sierbert Creek and the Strait....." However discharge for Seibert Creek is not shown on figure 1.4-3 Page 1-13. | Courtier |
| ⑤ | 1-14 | Par 11 2nd sentance states: "The filtering and coalescing stage maybe by passed when no oil is present." It is believed the by pass capability should be eliminated, one more chance of human error would be removed. | Schmuck |
| | 1-15 | Par 4: A Fire Protection System status display panel should be provided. | Schmuck |
| | 1-15 | Par. 6 Provisions should be made to keep the capacity of one tank available in one or more tanks at the on shore facility. If a tank were to become involved in a fire the crude could be pumped into the ullage reducing the amount of crude involved and would reduce the chance of oil froth being generated. Oil froth could be more disasterous than a fire. | Courtier |
| ⑥ | 1-15 | Par 7 Regarding the utility fire truck, who would be responsible for housing, manning and maintaining the vehicle, the Fire District or Northern Tier? | Schmuck |
| ⑦ | 1-15 | Par 8 States:" Firefighting procedures and the detailed design of the Fire Protection System would be developed in cooperation with the Port Angeles Fire Department......" The on shore facility is to be located in Clallam County Fire Protection Dist-#3 not Port Angeles. Firefighting operations are the responsibility of District #3. Fire Prevention is the responsibility of the Clallam County Fire Marshall. A statement should added to read essentally. Fire protection and fire fighting procedures will be developed in cooperation with the Clallam County Fire Marshall and the Commissioners of Fire Protection District #3 through the District Chief and the Port Angeles Fire Chief. County Department of Emergency | Courtier |

2

**27**
CONT

| | Item | Page | | Individual |
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| ⑦ | | | Services will be consulted to insure contingency plans are developed. | |
| ⑧ | 10 | 1-23 | Table 1.4-9 Clallam County should be added. The proposed pipeline route will cause the line to cross the following irrigation ditches:<br>Ursin<br>Independent<br>Highland (2 branches)<br>Agnew<br>The Agnew ditch also supplies water to the McDonald Creek.<br>These ditches take water from the Dungeness River above the proposed river crossing. The water is used for stock and domestic water in addition to normal irrigation. If a spill were to occur in the Dungeness River or in a ditch returning water to the river, irrigation ditches and systems down stream would be contaminated as well. | Courtier |
| ⑨ | 11 | 1-29 | Figure 1.4-4 Reccomend heliport be relocated to an area between strainers, the control building and fence. Having the heliport in a corner creates the risk of the helicopter motor contacting the fence and possibly causing the aircraft to crash. It is not uncommon for aircraft crashes to result in fire. Having the heliport in a more open area will reduce the possibilty of a crash. | Courtier |
| ⑩ | 12 | 1-29 | Figure 1.4-4 Some objects in the drawing are unidentified and some are obvious. Two things near the fence between the surge tank dike and the remainder of the pump station have the same physical charicteristics as the valves, but they are not identified. What are they? | Schmuck |
| ⑪ | 13 | 1-30 | Figure 1.4-5 Recommended heliport be relocated to a more open area between the strainers, control building and fence. see item 11 above for rationale. | Courtier |
| ⑫ | 14 | 1-30 | Figure 1.4-5 Two objects near the fence about in line with the manifold system between the surge tank dike and the rest of the pressure reducing station are not identified. What are they? | Schmuck |
| ⑬ | 15 | 1-31 | Par 10 addresses "minor spills" What is a minor spill and how will spills exceeding the volume be dealt with? | Schmuck |
| ⑭ | 16 | 1-33 | Figure 1.4-6 Recommend heliport be relocated to the area between the sub-station, main line pumps and the fence. see item 11 above for the purpose of this recommendation. | Courtier |
| ⑮ | 17- | 1-33 | Figure 1.4-6 It appears that the dike has openings on two sides. Is there an opening on two sides or is the figure drawn that way because it cannot be done to scale and get it on the page? | Schmuck |

| | Item- | Page | | Individual |
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| | 18 | 1-34 | Figure 1.4-7 see item 16 above | |
| | 19 | 1-34 | Figure 1.4-7 see item 17 above | |
| | 20 | 1-36 | Figure 1.4-8 see item 16 above | |
| | 21 | 1-36 | Figure 1.4-8 see item 17 above | |
| ⑯ | 22 | 1-50 | Par 7 What would be the qualifications of the individual making the certification? | Schmuck |
| ⑰ | 23 | 1-50 | Par 8 States in part:" All oil in the piping and valves within the tank farm would be drained and transported to another operating system in the area." There are no other systems in the area. Where would it be taken or how would disposal be accomplished? | Schmuck |
| ⑱ | 24 | 1-50 | Par 8 last sentance: since oil and water are immiscible. how free of risidual oil will the system be? | Courtier |
| ⑲ | 25 | 1-50 | Par 9 What qualifications will the person doing the certification have? | Courtier |
| ⑳ | 26 | 1-50 | Par 10 What would the inhibitor be? Might it be hazardous or cause environmental degradation? | Courtier |
| ㉑ | 27 | 1-50 | Par 11 Recommend complete removal of the pipe line to preclude failure of the pipe walls and subsequent polution by risidual crude oil. | Courtier |
| ㉒ | 28 | 1-54 | Par 5 and 6 The contingency plan and comprehensive emergency plan should be a mandatory part of the environmental statement. It could be refined later. | Courtier |
| ㉓ | 29- | 1-54 | Par 6 Clallam County Department of Emergency Services and Clallam County Fire Protection District #3 should be included in the developement of contingency plans for Clallam County facilities. | Schmuck |
| ㉔ | 30 | 1-55 | The list of Agencies telephone numbers should include Clallam County Department of Emergency Services. | Schmuck |
| ㉕ | 31 | 1-56 | Par 10 What disposition will be made of the soil saturated with crude? | Schmuck |
| ㉖ | 32 | 1-56 | Par 11 item 2 The manning of the Fire Boat is discussed in item 1 above. Will NTPC provide manpower for the Fire Truck or will Clallam County Fire Protection District #3 provide Firefighters? | Schmuck |
| ㉗ | 33 * | 1-58 | Item 27 Recommend purging be prohibited in any part of the Strait. Purging if permitted at all should be at open sea. | Courtier |

CONT

| | Item | Page | | Individual |
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| ㉘ | 34 * | Ch. 2 | Generally the air quality addressed Port Angeles and the Olympic National Park. However the area to the East of the proposed port and on shore facility is ignored. Since the prevailing wind is from a Westerly direction considerable attention should be given to air quality to the East of the proposed facility. | Courtier |
| ㉙ | 35 | 2-44 | Par 2 As it relates to Fire Protection District #3 should read: Fire Protection District #3 which serves the Green Point area encompasses over 164 square miles It has a full time paid Chief and 80 volunteers. There are five Fire Stations, 6 Pumpers, 3 water tankers, 2 Aid Cars and a Chief's vehicle. It is rated 8 by the Washington Surveying and Rating Bureau. (The scale used is 1 to 10 with 10 being the lowest level of protection.) | Courtier |
| ㉚ | 36 | 2-44 | Par 3 is not accurate. Sequim has one Pumper, one Pumper belongs to Fire Protection District #3 is housed in the Sequim Fire Department. It is used by the Sequim Volunteer Fire Department to respond to fire in Sequim and in part of Fire Protection District #3 immediately around Sequim. | Schmuck |
| ㉛ | 37 | 2-115 | Par 8: The Dungeness River is not included but should be since it is an important salmon and steelhead spawning river as well as being the source of water for irrigating a large area. | Courtier |
| ㉜ | 38 | •2-133 | Par 3: Last sentance should read: In North Dakota there would be numerous Intercontinental Ballistic Missile (ICBM) Cable crossings. | Courtier |
| ㉝ | 39 | •2-156 | Par 1: Reference is made to U.S. 101 and figure 2.1 1.13-1 (page 2-33) Figure 2.1.1.13-1 does not depict the fact being verbalized. | Courtier |
| ㉞ | 40 * | 5-1 | Par 5 Since there would be an unavoidable increase on $SO_2$ over the Port Angeles area for such a short period of time does this mean the downwind area will have the $SO_2$ most of the time?<br>It is recommended that scrubbers be required to capture the $SO_2$. | Courtier |
| ㉟ | 41 | 5-2 | Generally the Air quality with respect to particulates $SO_2$, $NO_x$ and $O_3$ address the Port Angeles area and ONP. The area to the East which is down wind of the proposed sites should be considered in more detail. | Courtier |
| ㊱ | 42 | •5-2 | Par 10 odor: Odors related to the on shore facility are not addressed. It is assumed odors will be similar to other crude oil facilities. If this is so the problem must be delt with. | Schmuck |
| ㊲ | 43 | 5-9 | Table 5.1.12-2 Added to the possible impacts column should be a statement that reads essentally: : Oil | Courtier |

| | Item | Page | | Individual |
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| | | | froth caused by water turning to steam in the oil could cause wide spread damage." Water changing to steam expands in excess of 1,500 to 1. 1 gallon of water makes in excess of 1,500 gallons by volume of steam under normal atmospheric pressures water changes to steam in crude and heavy oils results in a froth wave that engulf structures, people and stock. It is adhesive and can be hot enough to cause burns on flesh. | |
| | 44 | 5-12 | Table 5.1.15-1 Unavoidable impacts: Fire Protection during operation: In addition to straining local departments residents in the Green Point area would be greatly inconvienced by Fire Fighting activities, spectators, New media and from the smoke, ~~[illegible]~~ and possibly oil froth. Residents with shore property that permits a view of the Green Point area would undoubtedly be bothered by the Press and Television News people seeking spectacular photo. coverage of any major fire or explosion. | Courtier |
| | 45 | •5-16 | Par 8 and 9 It appears that if it will take up to 20 years for complete recovery of a destroyed salmon population, they might as well be written off as lost. | Courtier |
| | 46 | •6-2 | Par 7 With respect to the Bald Eagles. The author of the DES may know of alternative habitat being available nearby, but how do we tell the Bald Eagle that? | Courtier |
| ㊳ | 47 | 6-4 | Par 4 Air quality for the inhabited area East of the proposed Port and On Shore Facility is not considered since that area is downwind a carefull analysis should be made. | Courtier |
| | 48 | •8-3 | Par 2 and 3 Clallam County to the East of the proposed site at Green Point is similar to Burrows Bay in that it has neglegable industry and has important Marine and terrestrial resources and like Freshwater Bay the area has relatively little developement. It is believed the impacts at Port Angeles and Green Point would be equal to or greater than the impacts at Burrows Bay or Freshwater Bay. | Schmuck |
| | 49 | 8-5 | Par 14 If Alaskan Crude spilled at Long Beach would cause critical environmental impacts it is believed the same spill at Port Angeles, Green Point or along the pipeline in Clallam County and Jefferson County would be devistating. | Schmuck |
| ㊴ | 50 | •8-10 | Since the down wind area was considered for Cherry Point the leeward side of Port Angeles and Green Point should also be considered. | Courtier |

| | Item | Page | | Individual |
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| ㊵ | 51 | 8-12 | Par 4 If a spill were to have an impact on the nearly level and fertile land in the Cherry Point area, it is more than probable that a spill in anyone of the irrigation ditches or in the Dungeness River would have an impact on fertile farm land in Clallam County. | Schmuck |

While the DES is an impressive document it appears that there is much more research needed before the final environmental statement is completed.

The Board of Commissioners for Fire Protection District #3 are intensly interested in all safety, social and other fragments of the propsed system. If it must be in or transit Fire Protection District #3 it is their wish to have a system that is safe now and will continue to be that way.

J Claud Courtier Jr.
J. Claud Courtier, Jr. Chairman

Ernie Schmuck
Ernie Schmuck Commissioner

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**28**

Bureau of Land Management
P.O. Box 2965n
Portland, Oregon 97208
March 1, 1979

Having come across your article with an address to write to, I decided for once I wanted to have my feelings known.

I am a homemaker, having a husband and three teenage children, live in a small home. I am for environment protection, clean air and water. But I think the time has come for compromise between the Federal and State governments. People in the northern part of this country have always had to pay more for every thing. Just because we live where we do. With a pipeline in this region we wouldn't have to depend on other countries. Canada has cut back on our fuel, so that leaves the greedy Arab countries. They have forgot who put them in the position they are in now. If it hadn't been for this countries money they wouldn't have the technology they have today. I don't say we should get oil for nothing, but why blood us and others to death.

When we have refineries up here it is crazy to not have our own supply of oil brought in to this region by a pipeline. This country better start looking out for its own people. People are feed up with being taken for a ride. People will conserve, but they better now be lied to any more. We are feed up with a few people making decisions that cost us middle class people more money every time we go for food, heating oil, utilities. Some of us have to work without cost of living raises. We can't increase our wages when we feel like we need more money each month.

We need a pipeline here and the people against better decide if they can heat their homes, businesses, farms and equipment on fuel or pride.

2.

For they may find themselves with nothing. We will see how long this keeps them warm when it gets -50 below zero. The Federal and State Officials should be able to work together for the people of this region for one time. This pipeline will help this whole country also.

My letter will probably be filed in the unimportant, but at least I had my say. Even if I am just a homemaker that had to go find a part time job to help offset the cost increases every week. It use to be every month, now it is every day and week.

Thank you for taking the time from your busy job to let me put my feeling on paper.

Sincerely Yours,
Mrs. Rodney L. Anderson

Mrs. Rodney L. Anderson
1801 6Th Steet South
Bemidji, Minnesota 56601

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**29**

*Lewistown News-Argus*
CENTRAL MONTANA PUBLISHING CO.
PHONE (406) 538-3401
P.O. BOX 900
LEWISTOWN, MONTANA 59457

February 28, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 NE Multnomah
Portland, Ore. 97232

Gentlemen:

This is in regard to your hearing in Billings, March 6, on the Northern Tier Pipeline.

I am unable to be there, but will appreciate having this letter entered into the record.

Our newspaper favors the project very strongly, and I am confident that we reflect the attitude of the great majority in our area on this.

Many miles of the pipeline will go through an area served by our newspaper, and we have heard no opposition expressed to the pipeline. We have, however, heard much said for it.

The need for this pipeline to Montana is vital as much of our source of crude oil from Canada is being cutoff.

Also, the international situation on crude is very serious for the United States and the entire area to be served by the Northern Tier Pipeline. So it seems very important that we make our Alaskan oil available just as quickly as possible.

Respectfully yours,
Ken Byerly
Ken Byerly
Publisher

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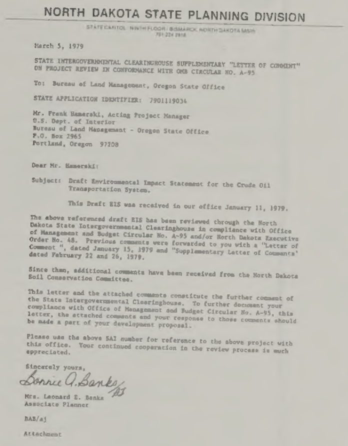


NORTH DAKOTA STATE PLANNING DIVISION

STATE CAPITOL · NINTH FLOOR · BISMARCK, NORTH DAKOTA 58505

March 5, 1979

STATE INTERGOVERNMENTAL CLEARINGHOUSE SUPPLEMENTARY "LETTER OF COMMENT" ON PROJECT REVIEW IN CONFORMANCE WITH OMB CIRCULAR NO. A-95

To: Bureau of Land Management, Oregon State Office

STATE APPLICATION IDENTIFIER: 7901119034

Mr. Frank Hamerski, Acting Project Manager
U.S. Dept. of Interior
Bureau of Land Management - Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Hamerski:

Subject: Draft Environmental Impact Statement for the Crude Oil Transportation System.

This Draft EIS was received in our office January 11, 1979.

The above referenced draft EIS has been reviewed through the North Dakota State Intergovernmental Clearinghouse in compliance with Office of Management and Budget Circular No. A-95 and/or North Dakota Executive Order No. 48. Previous comments were forwarded to you with a "Letter of Comment ", dated January 15, 1979 and "Supplementary Letter of Comments' dated February 22 and 26, 1979.

Since then, additional comments have been received from the North Dakota Soil Conservation Committee.

This letter and the attached comments constitute the further comment of the State Intergovernmental Clearinghouse. To further document your compliance with Office of Management and Budget Circular No. A-95, this letter, the attached comments and your response to those comments should be made a part of your development proposal.

Please use the above SAI number for reference to the above project with this office. Your continued cooperation in the review process is much appreciated.

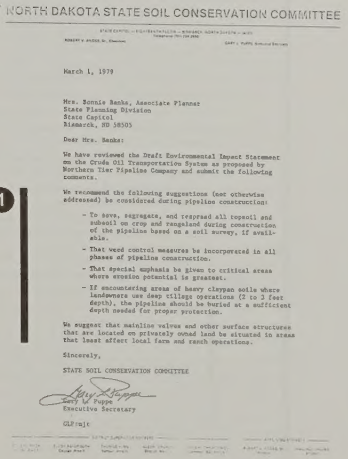
Sincerely yours,

Bonnie A. Banks/aj

Mrs. Leonard E. Banks
Associate Planner

BAB/aj

Attachment



NORTH DAKOTA STATE SOIL CONSERVATION COMMITTEE

March 1, 1979

Mrs. Bonnie Banks, Associate Planner
State Planning Division
State Capitol
Bismarck, ND 58505

Dear Mrs. Banks:

We have reviewed the Draft Environmental Impact Statement on the Crude Oil Transportation System as proposed by Northern Tier Pipeline Company and submit the following comments.

❶ We recommend the following suggestions (not otherwise addressed) be considered during pipeline construction:

- To save, segregate, and respread all topsoil and subsoil on crop and rangeland during construction of the pipeline based on a soil survey, if available.
- That weed control measures be incorporated in all phases of pipeline construction.
- That special emphasis be given to critical areas where erosion potential is greatest.
- If encountering areas of heavy claypan soils where landowners use deep tillage operations (2 to 3 feet depth), the pipeline should be buried at a sufficient depth needed for proper protection.

We suggest that mainline valves and other surface structures that are located on privately owned land be situated in areas that least affect local farm and ranch operations.

Sincerely,

STATE SOIL CONSERVATION COMMITTEE

Gary L. Puppe
Executive Secretary

GLP:mjt

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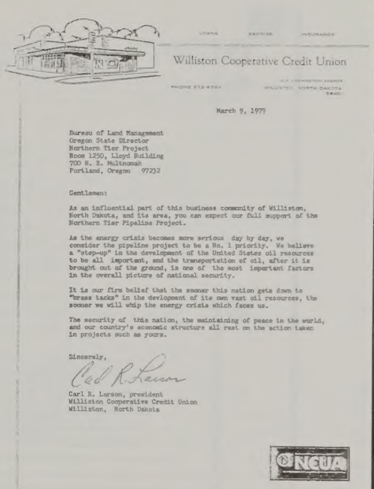

Williston Cooperative Credit Union

March 9, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Gentlemen:

As an influential part of this business community of Williston, North Dakota, and its area, you can expect our full support of the Northern Tier Pipeline Project.

As the energy crisis becomes more serious day by day, we consider the pipeline project to be a No. 1 priority. We believe a "step-up" in the development of the United States oil resources to be all important, and the transportation of oil, after it is brought out of the ground, is one of the most important factors in the overall picture of national security.

It is our firm belief that the sooner this nation gets down to "brass tacks" in the devlopment of its own vast oil resources, the sooner we will whip the energy crisis which faces us.

The security of this nation, the maintaining of peace in the world, and our country's economic structure all rest on the action taken in projects such as yours.

Sincerely,

Carl R. Larson

Carl R. Larson, president
Williston Cooperative Credit Union
Williston, North Dakota

NCUA

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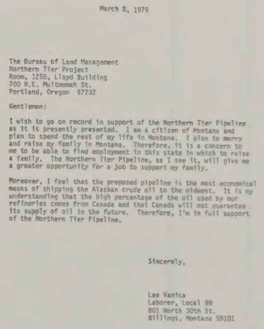

March 8, 1979

The Bureau of Land Management
Northern Tier Project
Room, 1250, Lloyd Building
700 N.E. Multnomah St.
Portland, Oregon 97232

Gentlemen:

I wish to go on record in support of the Northern Tier Pipeline as it is presently presented. I am a citizen of Montana and plan to spend the rest of my life in Montana. I plan to marry and raise my family in Montana. Therefore, it is a concern to me to be able to find employment in this state in which to raise a family. The Northern Tier Pipeline, as I see it, will give me a greater opportunity for a job to support my family.

Moreover, I feel that the proposed pipeline is the most economical means of shipping the Alaskan crude oil to the midwest. It is my understanding that the high percentage of the oil used by our refineries comes from Canada and that Canada will not guarantee its supply of oil in the future. Therefore, I'm in full support of the Northern Tier Pipeline.

Sincerely,

Lee Vanica
Laborer, Local 98
801 North 30th St.
Billings, Montana 59101

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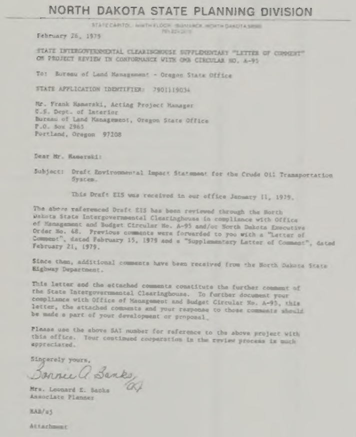


NORTH DAKOTA STATE PLANNING DIVISION

STATE CAPITOL · NINTH FLOOR · BISMARCK, NORTH DAKOTA 58505

February 26, 1979

STATE INTERGOVERNMENTAL CLEARINGHOUSE SUPPLEMENTARY "LETTER OF COMMENT" ON PROJECT REVIEW IN CONFORMANCE WITH OMB CIRCULAR NO. A-95

To: Bureau of Land Management - Oregon State Office

STATE APPLICATION IDENTIFIER: 7901119034

Mr. Frank Hamerski, Acting Project Manager
U.S. Dept. of Interior
Bureau of Land Management, Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Hamerski:

Subject: Draft Environmental Impact Statement for the Crude Oil Transportation System.

This Draft EIS was received in our office January 11, 1979.

The above referenced Draft EIS has been reviewed through the North Dakota State Intergovernmental Clearinghouse in compliance with Office of Management and Budget Circular No. A-95 and/or North Dakota Executive Order No. 48. Previous comments were forwarded to you with a "Letter of Comment", dated February 15, 1979 and a "Supplementary Letter of Comment", dated February 21, 1979.

Since then, additional comments have been received from the North Dakota State Highway Department.

This letter and the attached comments constitute the further comment of the State Intergovernmental Clearinghouse. To further document your compliance with Office of Management and Budget Circular No. A-95, this letter, the attached comments and your response to those comments should be made a part of your development or proposal.

Please use the above SAI number for reference to the above project with this office. Your continued cooperation in the review process is much appreciated.

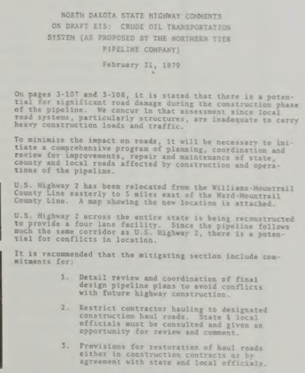
Sincerely yours,

Bonnie A. Banks/aj

Mrs. Leonard E. Banks
Associate Planner

BAB/aj

Attachment



NORTH DAKOTA STATE HIGHWAY COMMENTS
ON DRAFT EIS: CRUDE OIL TRANSPORTATION
SYSTEM (AS PROPOSED BY THE NORTHERN TIER
PIPELINE COMPANY)

February 21, 1979

On pages 3-107 and 3-108, it is stated that there is a potential for significant road damage during the construction phase of the pipeline. We concur in that assessment since local road systems, particularly structures, are inadequate to carry heavy construction loads and traffic.

To minimize the impact on roads, it will be necessary to initiate a comprehensive program of planning, coordination and review for improvements, repair and maintenance of state, county and local roads affected by construction and operations of the pipeline.

❶ U.S. Highway 2 has been relocated from the Williams-Mountrail County Line easterly to 5 miles east of the Ward-Mountrail County Line. A map showing the new location is attached.

U.S. Highway 2 across the entire state is being reconstructed to provide a four lane facility. Since the pipeline follows much the same corridor as U.S. Highway 2, there is a potential for conflicts in location.

❷ It is recommended that the mitigating section include commitments for:

1. Detail review and coordination of final design pipeline plans to avoid conflicts with future highway construction.
2. Restrict contractor hauling to designated construction haul roads. State & local officials must be consulted and given an opportunity for review and comment.
3. Provisions for restoration of haul roads either in construction contracts or by agreement with state and local officials.

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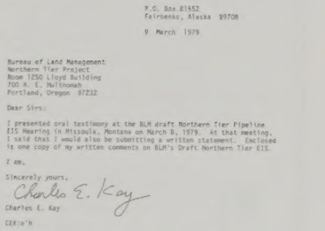


P.O. Box 81552
Fairbanks, Alaska 99708

9 March 1979

Bureau of Land Management
Northern Tier Project
Room 1250 Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Sirs:

I presented oral testimony at the BLM draft Northern Tier Pipeline EIS Hearing in Missoula, Montana on March 8, 1979. At that meeting, I said that I would also be submitting a written statement. Enclosed is one copy of my written comments on BLM's Draft Northern Tier EIS.

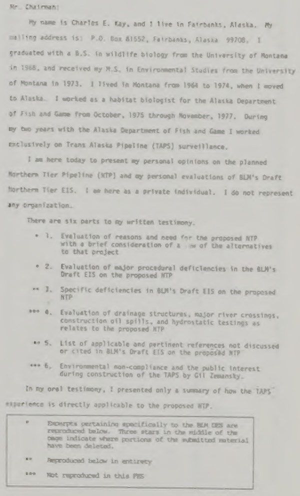
I am,

Sincerely yours,

Charles E. Kay

Charles E. Kay

CEK:e'h



Mr. Chairman:

My name is Charles E. Kay, and I live in Fairbanks, Alaska. My mailing address is: P.O. Box 81552, Fairbanks, Alaska 99708. I graduated with a B.S. in wildlife biology from the University of Montana in 1968, and received my M.S. in Environmental Studies from the University of Montana in 1973. I lived in Montana from 1964 to 1974, when I moved to Alaska. I worked as a habitat biologist for the Alaska Department of Fish and Game from October, 1975 through November, 1977. During my two years with the Alaska Department of Fish and Game I worked exclusively on Trans Alaska Pipeline (TAPS) surveillance.

I am here today to present my personal opinions on the planned Northern Tier Pipeline (NTP) and my personal evaluations of BLM's Draft Northern Tier EIS. I am here as a private individual. I do not represent any organization.

There are six parts to my written testimony.

* 1. Evaluation of reasons and need for the proposed NTP with a brief consideration of a few of the alternatives to that project

* 2. Evaluation of major procedural deficiencies in the BLM's Draft EIS on the proposed NTP

** 3. Specific deficiencies in BLM's Draft EIS on the proposed NTP

*** 4. Evaluation of drainage structures, major river crossings, construction oil spills, and hydrostatic testings as relates to the proposed NTP

** 5. List of applicable and pertinent references not discussed or cited in BLM's Draft EIS on the proposed NTP

*** 6. Environmental non-compliance and the public interest during construction of the TAPS by Gil Zemansky.

In my oral testimony, I presented only a summary of how the TAPS experience is directly applicable to the proposed NTP.

* Excerpts pertaining specifically to the BLM DES are reproduced below. Three stars in the middle of the page indicate where portions of the submitted material have been deleted.

** Reproduced below in entirety

*** Not reproduced in this FES

34 CONT

### Reasons, Needs, and Alternatives

BLM is in error when they consider this proposal to be the Northern Tier Pipeline. What we really are discussing today is the Washington to Minnesota extension of the Trans Alaska Pipeline (TAPS) plus the Long Beach, California to Midland, Texas or SOHIO extension of the TAPS for the Northern Tier Pipeline Company (NTPC) has officially stated that their project is not in competition with the planned SOHIO pipeline. The TAPS was the wrong pipeline built to the wrong place and now the public is faced with the possibility of building two new crude oil distribution systems to aleviate the "surplus oil" situation that has been created on the West Coast by construction of the TAPS.

* * *

This historical ANS "surplus" oil perspective is important since we are in this position today because National decisions were based on figures supplied by the oil companies. ① In the BLM's Draft EIS on the proposed Northern Tier Project, BLM states that the two overriding considerations in their review of the Northern Tier extension of the TAPS are: 1) ANS oil "surplus" on the West Coast, and 2) shortfall or lack of oil in the Northern Tier states. The only "surplus" or shortfall figures that BLM presents were compiled by oil companies or with company consultants. BLM does not present any independent analysis of "surplus" or shortfall. The American people believed the oil companies once and we are here today. Why should the American public now believe these new estimates from these oil companies? Why has BLM not developed a totally independent evaluation of the ANS "surplus" problem?

BLM estimates that there is currently a "surplus" of 500-600,000 bpd on the West Coast. BLM does not mention the fact that during the first four months of 1978 624,300 barrels per day of foreign crude oil were imported to this same West Coast.

> It was considered that the Valdez terminus could free the Pacific district from foreign imports and yet in the first 4 months of 1978 the Pacific district imported 624,300 barrels of crude daily. Few steps were taken to modify existing refinery capacity to accept North Slope oil with its relatively high sulphur content. As a result, the Pacific district continues to import foreign crude while North Slope production is deemed surplus.
>
> Shannon Wall, President
> National Maritime Union of America (54)

How can we be importing over 600,000 bpd of foreign crude oil to the West Coast at the same time BLM would have us believe there is a "surplus" of 500,000 bpd of ANS oil on the same West Coast? The oil refineries on the West Coast import foreign crude oil in part because those refineries are not designed to refine ANS oil. Oil is not oil is not oil. An oil refinery is designed to process a particular type of crude oil based on the specific gravity and sulfur content of the crude. The ANS oil is called a sour crude because it has a sulfur content slightly above one percent.

* * *

However, retrofitting West Coast oil refineries to process the ANS oil is a viable alternative to the proposed NTP.

* * *

② If the oil refineries on the West Coast were retrofit to process the ANS oil, this would alleviate the "surplus" on the West Coast and at the same time over 600,000 bpd of foreign oil would not have to be imported to that region. In their Draft NTPC EIS, BLM does not discuss this alternative. NTPC officials have publicly stated that the estimated construction cost of their proposed project is approximately 1.8 billion dollars. How much would it cost to retrofit the oil refineries on the West Coast so that they could process all of the "surplus" ANS? I believe that BLM should undertake a complete analysis of retrofitting as a solution to the "surplus" ANS on the West Coast.

③ The Northern Tier Pipeline Company states that because of scheduled curtailments of Canadian crude oil into the Northern Tier states there will be a shortfall of crude oil in that region during the 1980's. In the BLM draft EIS on the proposed Northern Tier Pipeline, the only data BLM presents on "anticipated" or "estimate" shortfall was again, developed by oil companies, or oil company consultants. BLM does not present any independent analysis of projected shortfall in the Northern Tier states. During debate on the TAPS, the government accepted oil company data that said there would be no "surplus" on the West Coast. We now have the Alaskan Pipeline and the refineries on the West Coast cannot use ANS oil. It is logical to ask which specific oil refineries in the Northern Tier states will buy exactly what volume of oil from the Northern Tier Pipeline for how long. What refineries have signed agreements to purchase oil transported through the proposed Northern Tier Pipeline? This is a critical consideration. BLM should present the public with data that shows exactly which oil refineries in the Northern Tier states have agreed in writing to purchase exactly how much ANS oil and have it delivered to their refineries by the proposed Northern Tier Pipeline. If BLM or the oil refineries cannot or will not do this, I then suggest that there is absolutely no need for the Northern Tier Pipeline Project.

④ Another alternative that BLM fails to address is the abandonment of the TAPS. The TAPS from Delta Junction to Valdez could be abandoned and a new 48" oil pipeline built from Delta Junction down the Alcan Highway into the Midwest states where BLM tells us the ANS oil is now needed. This is the route originally favored by various environmental groups during the congressional debate on the TAPS in the early 1970's. The U.S. and Canada have already agreed to construct a large diameter natural gasline down this corridor[1] and the two pipelines could be built together off of the same right-of-way. The U.S. has a Hydrocarbon Transport Treaty with Canada that guarantees uninterrupted flow of U.S. gas or oil through any pipeline constructed in Canada. This alternative would eliminate the TAPS Valdez terminal and all TAPS generated tanker traffic. This would protect the Alaska, British Columbia, Washington, Oregon, California, Mexican, and Central American coasts from being impacted by a catastrophic oil spill that will occur when there is a tanker accident. I recommend that BLM conduct a detailed evaluation of this method of handling the problem of "surplus" ANS oil. This alternative would eliminate any need for either the Northern Tier Pipeline or the SOHIO Pipeline.

⑤ BLM also fails to present a complete analysis regarding shipment of ANS oil to the Gulf States. There is no "surplus" of ANS oil on the West Coast. BLM's "surplus" figure of 500-600,000 bpd ANS oil is not accumulating on the West Coast. The "surplus" oil isn't sitting off of the West Coast in tankers nor is it being stored on the West Coast. BLM's "surplus" ANS oil is currently being shipped to Gulf Coast ports where it is offloaded and distributed into the middle United States via the numerous pipelines which serve that region. ANS oil is presently reaching oil refineries in Minnesota and Chicago via the existing pipeline systems. This is part of the reason why the large refineries in the Midwest have not supported the Northern Tier Pipeline. Those oil refineries are presently obtaining ANS oil at a similar cost through the Gulf states. Furthermore, other pipeline companies are proposing to build additional pipelines from the Gulf area into Minnesota to transport more ANS oil into that region. These other pipeline proposals are in direct competition with the planned Northern Tier Project and they are the reason the State of Minnesota has denied a Certificate of Need to the NTPC. Yet, BLM in their Draft EIS fails to present more than a cursory analysis of this alternative. A recently released Department of Energy (DOE) study has concluded that for the NTPC to be economically viable, the NTPC must sell most of its throughput in the Minnesota to Chicago market. DOE states that approximately 1/2 of NTPC throughput would have to compete in the Chicago market. This region is presently served by numerous pipelines that start in the Gulf States. The NTPC, to be economically viable, must compete in an area served by an array of other pipeline companies. It is my opinion that BLM should undertake a comprehensive study of the utilization of mid-continental pipeline systems to transport ANS oil to determine if the NTPC could compete in that market.

⑥ A fourth alternative to the proposed NTP that BLM does not consider involves reducing the throughput of the TAPS down to the level that can presently be utilized on the West Coast.

* * *

In conclusion to this portion of my testimony, I believe that the United States and the American public need a comprehensive National Energy Policy before any pipeline project is approved by the Federal Government. The question of how to best utilize our ANS oil should be considered in its entirety not on a peacemeal SOHIO here NTPC there basis. We are here today because National Energy decisions were formulated and promoted by oil companies not in the true national interest, but in the name of company profit. I believe it is time for the public and our elected representatives to decide what is best for ourselves and not have this function performed for us by oil companies.

### ⑦ Major Deficiencies in BLM's Draft EIS on the Proposed NTP

30 U.S.C.A. Section 185 of the Mineral Leasings Act is the federal law that applies to rights-of-way for pipelines through public lands. Subsection (d) in width limitations states:

> The width of a right-of-way shall not exceed fifty feet plus the ground occupied by the pipeline (that is, the pipe and its related facilities) unless the Secretary or agency head finds and records the reasons for his finding, that in his judgment a wider right-of-way is necessary for operation and maintenance after construction, or to protect the environment or public safety. Related facilities include but are not limited to valves, pump stations, supporting structures, bridges, monitoring and communication devices, surge and storage tanks, terminals, roads, airstrips and campsites, and they need not necessarily be connected or contiguous to the pipe and may be the subjects of separate rights-of-way.

In BLM's draft EIS on the proposed Northern Tier project, BLM states that the NTPC has requested a temporary right-of-way 90 feet wide for construction and a permanent right-of-way width of 75 feet. Under 30 U.S.C.A. 185 (d) the Secretary of the Interior or the head of the BLM must record his reasons for permitting a right-of-way greater than 50 feet plus the ground occupied by the pipeline which in this case is approximately 54 feet. In their draft EIS, BLM does not present any reasons to support NTPC's request for right-of-way widths of 75 feet permanent and 90 feet temporary. As I understand this law, the head of the BLM or the Secretary of the Interior must submit a detailed report specifying why the NTPC should be granted a right-of-way greater than 54 feet. I hereby respectively request this report from the BLM since this report is not presented in their draft EIS. In this regard, it must be remembered that Alyeska's federal grant of right-of-way for the TAPS was limited to 54 feet (1). I believe that the question that BLM must adequately address is Why does the NTPC require a 90-feet temporary and 75 feet permanent right-of-way when Alyeska constructed the TAPS on a Federal right-of-way of 54 feet.

30 U.S.C.A. 185 (h) states:

> Environmental Protection
>
> ⑧ (h) (1) Nothing in this section shall be construed to amend, repeal, modify, or change in any way the requirements of section 4332(2) (C) of Title 42 or any other provision of the National Environmental Policy Act of 1969.
>
> (2) The Secretary or agency head, prior to granting a right-of-way or permit pursuant to this section for a new project which may have a significant impact on the environment, shall require the applicant to submit a plan of construction, operation, and rehabilitation for such right-of-way or permit which shall comply with this section. The Secretary or agency head shall issue regulations or impose stipulations which shall include, but shall not be limited to: (A) requirements for restoration, revegetation, and curtailment of erosion of the surface of the land; (B) requirements to insure that activities in connection with the right-of-way or permit will not violate applicable air and water quality standards nor related facility siting standards established by or pursuant to law; (C) requirements designed to control or prevent (i) damage to the environment (including damage to fish and wildlife habitat), (ii) damage to public or private property, and (iii) hazards to public health and safety; and (D) requirements to protect the interests of individuals living in the general area of the right-of-way or permit who rely on the fish, wildlife, and biotic resources of the area for subsistence purposes. Such regulations shall be applicable to every right-of-way permit granted pursuant to this section, and may be made applicable by the Secretary or agency head to existing rights-of-way or permits, or rights-of-way or permits to be renewed pursuant to this section.

It is my opinion that BLM's draft NTP EIS does not comply with these provisions of the federal law. This portion of the federal pipeline right-of-way law states that the Secretary of Interior or head of the BLM must issue regulations or impose stipulations that shall be formulated to insure the adequate protection of the environment. BLM does not discuss any such regulations and I have not found any such regulations in the Federal Register. BLM does not discuss or present any preliminary stipulations that BLM would place on the proposed NTP.

* * *

30 U.S.C.A. 185 (l) permits the federal government to have continuous surveillance on the proposed Northern Tier Pipeline.

> Reimbursement of Costs
>
> (l) The applicant for a right-of-way or permit shall reimburse the United States for administrative and other costs incurred in processing the application and the holder of a right-of-way or permit shall reimburse the United States for the cost incurred in monitoring the construction, operation, maintenance, and termination of any pipeline and related facilities on such right-of-way or permit area and shall pay annually in advance the fair market rental value of the right-of-way or permit, as determined by the Secretary or agency head.

Under this provision of the federal pipeline right-of-way law, the NTPC would have to pay for all federal government monitoring and surveillance on their proposed project as Alyeska was required to do on the TAPS. This is another reason why the TAPS experience is directly applicable to the proposed NTP.

* * *

On the applicability of the TAPS experience to the proposed NTP, I would like to quote from an Alaska Pipeline Office (APO) Trans-Alaska Pipeline Overview Study that was prepared by Mechanics Research, Inc. in 1977. This is the official position of the Department of Interior's Alaska Pipeline Office.

> Stipulations for future projects should reflect the experience concerning mitigation of environmental impact gained during the construction and early operational phases of the Trans-Alaska Pipeline System. Experience gained in such potential problem areas as revegetation and rehabilitation, slope failures, icing due to disturbance of water flow, protection of wildlife, erosion control, etc., should be incorporated into the environmental and technical sections of the Stipulations. (40)

There were four years of continuous government surveillance by engineers and biologists during construction of the TAPS. There are scores of official documents evaluating the construction impacts and mitigation measures that were observed on the TAPS. There are thousands upon thousands of internal governmental memos and reports relating to the TAPS. In BLM's Draft NTP EIS there is not one mention or reference to any of the knowledge, experience or data that was gained on the Alaska project. BLM's total absence of the TAPS experience is even more unexplainable when one realizes that the BLM office in Portland which wrote the NTP Draft EIS had former Alaska Pipeline Officials on their staff. To assist BLM with their evaluation of the proposed NTP, I have included a list of 59 applicable documents for BLM's consideration. As part of my written testimony, I have also presented BLM with a copy of Mr. Gil Zemansky's publication entitled Environmental Non-Compliance and the Public Interest During Construction of the Trans Alaska Pipeline.

A large diameter natural gas pipeline is to be built from Prudhoe Bay down the TAPS corridor to Delta Junction where that gas line will turn to the east and proceed down the Alcan Highway through Canada and into the Midwest states. The state of Alaska and the federal government have profited from the TAPS experience in their formulation of stipulations for this gas line project. ⑨ The state of Alaska and the federal government have analyzed the TAPS experience, evaluated what worked, what didn't work, and why and then they used this knowledge to develop a more comprehensive set of stipulations under which the gas line will be built. (3) Alaska has even developed entirely new Social Economic stipulations that the state will impose on the Northwest Gas Company to reduce the adverse social and economic impacts that would otherwise accompany gas line construction. In short, the government in Alaska has utilized the TAPS example to design their next pipeline project so that the pipeline will produce fewer adverse impacts. The question that BLM must answer is why has BLM not followed a similar course of action in their evaluation of the proposed NTPC?

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[1] On September 22, 1977, pursuant to the Alaska Natural Gas Transportation Act of 1978, 15 U.S.C. 719, et seq., the President issued his Decision and Report to Congress on the Alaska Natural Gas Transportation System. In that Decision, the President designated a Northwest Energy subsidiary to construct and operate the Alaskan portion of the Alaskan Gas Project. On November 2, 1977, the President's Decision was ratified by Congress, and on December 16, 1977, the FERC issued a conditional certificate of public convenience and necessity (which is presently held by Alaskan Northwest Gas Transportation Company) authorizing the construction of facilities identified by the President. On July 4, 1977, the National Energy Board of Canada issued its Reasons for Decision, Northern Pipelines, and subsequently on April 4, 1978, subsidiaries of Foothills (Yukon) were issued Certificates of Public Convenience and Necessity by the Parliament of Canada under the provisions of the Northern Pipeline Act.

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I have reviewed NTPC's preliminary Construction Management Procedures and they do not appear to be conducive to a meaningful Quality Control Program. As was experienced during installation of the TAPS, quality control would be given a role subserviant to pipeline construction. NTPC's proposed Quality Control program is inferior to Alyeska's Quality Control. If the NTPC is permitted to build their project, I recommend:

1. QC/QA lease conditions and stipulations similar to those on the TAPS, but with certain modifications including a specific provision for adequate environmental QC.
2. Government review and approval of QC/QA manual, QC/QA personnel qualifications, and a QC/QA training program before any construction begins; with absolutely no exceptions.
3. QC/QA be totally independent of the Execution Contractor's or Construction Management's control or supervision.
4. QC/QA have stop work authority so that they are able to halt construction that is non-compliance.

Quality Control is one of the most important parts of any construction project. It does no good to have the best environmental stipulations, best welding procedures, technical specifications and the like if these are not enforced by a Quality Control Program. Without proper quality control procedures, adequate QC staff, QC independence, and QC stop work authority other regulations are ineffective and meaningless.

* * *

In this regard, it should also be remembered that four major oil spills occurred in the first month of operations of the TAPS; a pipeline that was supposedly designed, engineered and built not to leak once in its 30 year projected lifeline. During start-up, APSC experienced a human error coupled with a design failure as the crude oil reached pump station #8 that caused an explosion which completely destroyed the pump building. At pump station #9, a different design failure-human error problem resulted in the shutdown of that pump station when crude oil flooded the pump building and flowed out of the door. On the north slope, a front-end loader operator back-filling around check valve #7, struck a 3 inch bypass pipe on that check valve and approximately 50,000 barrels of crude oil escaped to cover the tundra. One month later, crude oil was discovered in Washington Creek north of Fairbanks. Upon investigation, APSC discovered that the bolts on check valve #64 had never been properly tightened and that 50 to 150 barrels of oil per day had leaked out of the TAPS undetected for 30 days until that oil was discovered in Washington Creek. How would BLM prevent similar situations from occurring if the NTPC is permitted to build their project?

It is my position that these examples clearly demonstrate that BLM should conduct a complete analysis of the TAPS data, knowledge and experience to determine what worked, what didn't work, and why. A thorough evaluation of the TAPS example is necessary to insure that adequate technical and environmental stipulations are formulated for any future pipeline construction project. Government surveillance on the TAPS should be carefully reviewed to guarantee that the mistakes of the past are not perpetuated into the future. The Department of Interior's Alaska Pipeline Office did an unsatisfactory job of enforcing Alyeska's compliance with the TAPS stipulations in part because APO's philosophy was "we are helping APSC build this pipeline" instead of "we are here to insure compliance with technical and environmental stipulations." APO disregarded environmental protection during construction of the TAPS to speed pipeline construction. APO engineers were in the position of authority and the biologists were only advisors.

Near the end of construction on the TAPS, JFWAT biologists were elevated to positions of authority and only then were long standing environmental problems given the attention that was mandated by the U.S. Congress when they passed the TAPS stipulations into law. On any future construction projects, biologists should be in positions of authority and not subservant to engineers. The Alaska Pipeline Office developed such an unfavorable reputation that APO will not perform government surveillance on the natural gas line that is to be built from Alaska through Canada

CONT

and into the Midwestern United States. An entirely new surveillance team is being organized for gas line monitoring based on the lessons that were learned on the TAPS project.

Montana's Senator John Melcher has repeatedly stated that he doesn't want the NTP project to turn into another Alaska pipeline. I agree with Senator Melcher, I would hope that Montana's environment would be accorded a much higher degree of protection than the inadequate protection that was extended to Alaska's resources. While I was working on TAPS surveillance, I never thought that I would be attempting to raise a pipeline company up to the standards of Alyeska, but this is the position I find myself in today.

10

BLM has not proposed any pipeline right-of-way lease conditions, technical stipulations, environmental stipulations, quality control or government surveillance in their draft EIS on the NTP. I contend that BLM must adequately address all these considerations to fulfill BLM's obligations under the National Environmental Policy Act and 30 U.S.C.A. 185 of the Mineral Leasing Act.

In conclusion, BLM states on page 4-1 of their Draft NTP EIS:

> Presently available information on the proposal described the pipeline route in terms of a 2-mile-wide corridor. The port and onshore storage facilities are described in terms of initial design specifications. This information is not sufficiently detailed to identify and quantify most site specific impacts. Federal, state, and local agencies generally require more specific information on proposed locations, design of system components, construction, and reclamation methods, and operating procedures to determine what mitigating measures would be required under existing regulations and codes. Similarly, private landowners need more site specific details about the proposal in order to determine what measures they would require as easement provisions.

BLM says that at this time they cannot delineate specific impacts that would be created by the proposed NTP because that project has not been adequately defined. Why then has BLM issued a Draft EIS when BLM admits they do not know what the impacts will be? The purpose of an EIS is to allow for a detailed evaluation and comparison of all the specific impacts that would be generated by any proposed project. Since BLM says they cannot yet define the specific impacts of the Proposed NTP, I question BLM's compliance with the provisions of the National Environmental Policy Act.

Fact 2

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Specific review comments on the BLM draft EIS
for the proposed Northern Tier Pipeline

by

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P.O. Box 81552
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presented to:

the Bureau of Land Management
at the March 8, 1979 public hearing on
the BLM Draft NTP EIS
in
Missoula, Montana

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CONT

LIST OF ACRONYMS

| | |
|---|---|
| A/G | Above Ground (pipeline) |
| APL | Access (roads to) Pipeline |
| AOFR | Authorized Officers Field Representative (Federal TAPS surveillance) |
| APO | Alaska Pipeline Office |
| APS | Access (road to) Pump Station |
| APSC | Alyeska Pipeline Service Company (owners of TAPS) |
| B/G | Below Ground (pipeline) |
| BLM | Bureau of Land Management |
| BPD | Barrels Per Day |
| CFS | Cubic Feet Per Second |
| CV | Check Valve |
| DOT | Department of Transportation (Federal Government) |
| DPA | Description of Proposed Action |
| DS | Disposal Site |
| EC | Erosion Control |
| EIS | Environmental Impact Statement |
| F&G | Fish and Game (Department, Montana) |
| FSO | Field Surveillance Office (State TAPS surveillance) |
| HYX | Highway (pipeline) Crossing |
| JFWAT | Joint Fish and Wildlife Advisory Team (TAPS surveillance) |
| MS | Material Sites (gravel or borrow pits) |
| MW | Megawatt (of electrical power) |
| NTP | Notice to Proceed (on TAPS) |
| NTPA | Notice to Proceed Application (on TAPS) |
| NTPC | Northern Tier Pipeline Company |
| OD | Outside Diameter (of pipe) |
| OEA | Olson-Elliott and Associates |
| O&M | Operations and Maintenance |
| OSF | Onshore Storage Facilities |
| OSHA | Occupational Safety and Health Association |
| PPM | Parts Per Million |
| PS | Pump Stations |
| Q | Discharge |
| QA | Quality Assurance |
| QC | Quality Control |
| RGV | Remote Gate Valve |
| ROW | Right-of-Way |
| RX | River Crossing |
| SCS | Soil Conservation Service |
| SPCO | State Pipeline Coordinator's Office (on TAPS) |
| TAPS | Trans Alaskan Pipeline System |
| USACE | U.S. Army Corps of Engineers |
| USFS | U.S. Forest Service |
| USGS | U.S. Geological Service |

In these review comments, there are frequent references to the Trans Alaska Pipeline System (TAPS). The TAPS is used as an example because it involved construction of a large diameter pipeline similar to the proposed Northern Tier Pipeline. On the TAPS, there was continuous government surveillance by biologists and engineers during all phases of construction. These government monitors, through actual field experience, evaluated various mitigating techniques. Portions of this knowledge are applicable to any pipeline project.

Only those portions of the Draft BLM Northern Tier Pipeline EIS pertaining to Montana were reviewed.

Chapter 1. Description of the Proposed Action.

11

Page 1-3 and 1-4. "Projected Supply and Demand."

All the BLM figures on projected supply, demand, and shortfall within the Northern Tier States were estimated by oil companies or consultant firms working for oil companies. It must be remembered that when the oil companies were seeking passage of the Trans Alaska Pipeline Authorization Act (Public Law 93-153), the oil companies assured the U.S. Congress and the American people that if they were allowed to build their Alaskan pipeline there would not be a surplus of that Alaskan oil in the U.S. West Coast. Now these same oil companies are stating that there is a surplus of Alaskan oil on the West Coast, there will be an oil shortfall in the Northern Tier States, and in the "National Interest and Energy Selfsufficiency" the oil companies must now build a new 1557 mile crude oil pipeline. As a minimum, BLM should retain their own experts and formulate projected oil supply, demand and shortfall totally independent of oil company influence.

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On page 1-4 BLM states, "The West Coast surplus is estimated to be about 500-600 thousand barrels per day (bpd) for 1978 (out of 1.2 million bpd ANS (Alaskan North Slope) production) and to rise to about 1 million bpd by 1985." In Table 1.4-1 on page 1-7, BLM quotes NTPC as stating that at the initial throughput of 709,000 bpd, 53 percent or 375,770 bpd would be Alaskan oil; the other 47 percent would be foreign crude oil. There is supposed to be a 500-600,000 bpd surplus of Alaskan oil on the West Coast yet Northern Tier proposes to transport only 375,000 bpd.

At ultimate capacity, Northern Tier would move 930,000 bpd, if we make the unsupported assumption that the throughput increase from the initial phase, 709,000 bpd to the ultimate phase, 930,000 or 237,000 bpd increase would be all Alaskan oil, then at ultimate capacity Northern Tier could transport the present West Coast surplus of Alaskan oil. However, by 1985 there would be an additional 500-600,000 bpd of Alaskan crude oil reaching the West Coast. Another surplus of 500-600,000 bpd will exist on the West Coast and the Northern Tier Pipeline would be full and at ultimate capacity. Whatever the advantages of the Proposed Northern Tier Pipeline happen to be, it is obvious that this project would not solve the problem of surplus Alaskan crude oil on the West Coast.

Pages 1-7 to 1-16. On the Marine Terminal were not reviewed.

Pages 1-16 to 1-17.

There would be 624 miles of pipeline in Montana. Of this total 60.4 miles would be in the Flathead Indian Reservation, 35.0 miles on BLM administered lands, 19.3 miles in the Lolo National Forest, and 9.7 miles in the Helena National Forest.

Page 1-18.

Under "State of Montana", line 9, Bitterroot River is incorrect; it should be Little Bitterroot River. The Bitterroot River is south of Missoula, Montana, not near the Flathead Indian Reservation. See page 93 of Map Addendum.

Page 1-18.

DOT requires that RX's be buried a minimum of 48 inches below the depth of scour of a waterway. BLM states that the pipeline will be buried 48 inches below the depth of scour. How is depth of scour to be computed? NTPC also plans to use pipe of increased wall thickness at all RX's.

Most of mainline is either .344" (40"OD) or .375" (42"OD).

| | Wall Thickness | Total Length |
|---|---|---|
| | .469" | 3.78 mi. |
| | .500" | .26 mi. |
| Total RX (NTPC Data) | .562" | .32 mi. |
| | .625" | 1.48 mi. |
| | .638" | .09 mi. |
| | 1.000" | .49 mi. |

BLM states that the RX pipe will be either concrete coated or that river weights will be utilized to keep the pipe from floating to the surface. How are RX's to be installed? At what time of year will the RX's be installed? On the TAPS a fish stream list was developed that set "windows" for allowable or permitted in stream work for each fish stream that was crossed by that pipeline.

Pages 1-21 and 1-22. RX's in Montana.

NTPC lists 25, but no data is provided on the size of each river and RX, depth of scour, depth of pipe below river bottom, etc.

Page 1-22.

NTPC lists 136 minor stream crossings in Montana. What is the size of each? How will these be installed? Will concrete coated pipe and a small RX be utilized or will it just be a "typical" pipeline spread digging up the watercourse?

Page 1-23.

BLM states that severe route conditions will result in an aerial RX. Severe route conditions are defined by NTPC as "very steep approaches to the stream bed such as canyons or gorges."

BLM states that the pipeline will parallel HVAC powerlines for 332.4 miles. These should be checked quite closely since some HVAC lines are located in some rather sensitive environmental areas; side hills, river bottoms, as examples.

Page 1-24. Mainline Valves.

BLM states that block and check valves will be installed to isolate pipeline sections in case of oil leakage from the line; on either side of PS, and at waterway crossings, as required by DOT. As per DOT requirements mainline valves will be installed at each of the following locations:

a) each side of PS.
b) lines to and from tank farms.
c) "on the mainline at locations along the pipeline system that will minimize damage from accidental discharge of crude oil, as appropriate for the terrain in open country or for locations near cities or other populations."
d) on each lateral line, ?
e) "on each side of a water crossing that is more than 100 feet from high-water mark to high-water mark."
f) "on each side of a reservoir holding water for human consumption."

BLM in Table 1.4-12, pages 1-25 and 1-26, lists the location of mainline valves as proposed by the NTPC. There is no analysis of the maximum spill volume for all pipeline sections. What is the maximum probable oil spill that could occur at sensitive areas, river crossings, and the like? BLM states that all PS and the pipeline RGV's will be remote controlled from the OCC. What type of leak or spill detection system will NTPC have? What about seismic or earthquake considerations as relates to design and oil spill probability analysis?

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Pages 1-24 to 1-32. Pump Stations.

PS are shown as having no buildings over the pumps, manifolds, and the like. How will this function in cold weather as relates to an oil spill induced shut off? On the TAPS pump stations, all the pumps, turbines, manifolds, and controls are located in heated buildings.

All NTPC's PS do not appear to be permanently staffed. Who will respond to an oil spill? How will these people be trained and equipped? Also, NTPC's communications system should be designed to insure a timely response in case of an oil spill or other system malfunction.

Due to the noise of the pumps and maintenance activity, all PS should be located away from sensitive wildlife areas. This includes siting away from watercourses since PS are prone to leaks and human errors that generate oil spills. Reference: TAPS PS #8 Explosion, and TAPS PS #9 Major Oil Spill.

NTPC plans to have "yard lights" around all PS. These lights will effect wildlife use of the adjacent areas during nighttime. NTPC will have back-up diesel fueled generators at each PS. How will the generator fuel be stored and handled? NTPC states that they will need permanent all weather access roads to each PS. Some of these APS will no doubt be new roads. This impact must be considered during the PS site selection and review process.

All pumps at NTPC's proposed PS are run by electric motors and therefore HVAC lines must be built to each PS. The HVAC lines will vary from 69 to 230 KV. These HVAC lines pose additional environmental considerations and they should be considered as part of the PS for PS siting purposes. NTPC states that their proposed PS will have a demand of 121.3 megawatts of electrical power at initial pipeline capacity and 349.6 megawatts at ultimate pipeline throughput. NTPC states that initial demand within Montana is for 39.0 MW with a final demand of 92.8 MW. Questions: Where is this power supposed to come from? Does NTPC presently have power contracts?

Pages 1-32 to 1-37. Delivery Facilities.

NTPC plans delivery facilities at its PS and intersection with the Glacier pipeline where NTPC plans to build 847,000 barrels of crude oil storage. At NTPC's intersection with the Western Crude Oil Line, 394,000 barrels of crude oil storage are slated for construction. Due to possible ruptures of storage tanks, associated noise and traffic, and other permanent disturbances, it is best to locate these proposed delivery facilities away from sensitive wildlife resources and all watercourses.

Page 1-35 and Figure 1.4-10 on page 1-38. Stages of Construction.
Page 1-41. Pipeline Construction.

NTPC intends to construct all the pipeline portion in just 8 to 12 months, mostly from April to November. This time limit to build over 1,500 miles of large diameter pipe in conjunction with NTPC's stated manpower and equipment estimates is, in my opinion, totally unrealistic if adequate environmental safeguards are enforced by the governmental regulatory agencies.

NTPC's inspection plan - QC/QA is not conducive to independent or meaningful quality control. For example, NTPC plans to have only two inspectors per pipeline spread or section. This number appears low especially when one considers all the paperwork requirements NTPC has outlined for their inspectors. Who will be watching the construction? NTPC should be required to have an independent QC/QA program. The QC/QA personnel must have stop work authority to be effective. NTPC's QC/QA plan should be specifically reviewed and approved by all government permitting agencies before any field construction is allowed to commence.

On the TAPS, the pipeline company, APSC, had undue influence over the inspection activities and procedures of their QC subcontractor -- Bechtel, Inc. And as a result, effective QC was almost totally lacking on the TAPS. For instance, due to falsification of records, no records, and a host of other reasons, APSC was forced by the Federal Government to re-x-ray over 4,000 welds that did not have proper documentation. These approximately 4,000 welds were on already buried below ground pipe or on already installed above ground pipe. These re-x-ray activities would have been unnecessary if there had been proper QC inspection and documentation, and therefore, due to this lack of an independent adequate QC/QA program, APSC caused unnecessary environmental problems during their re-x-ray program. It has been estimated that this re-x-ray due to inadequate QC, cost APSC (and finally all oil consumers - us) over $80,000,000.00.

Furthermore, to insure that NTPC's QC/QA program actually functions according to approved procedures, there must be continuous government surveillance and monitoring of all NTPC's work during a) preconstruction and planning, b) construction, c) O&M, and d) termination. The government inspectors must also have stop work authority. On the TAPS, the cost of all government surveillance, State and Federal, was fully reimbursed by APSC. This condition should also be applied to the NTPC as a mitigating measure. Continuous government surveillance is necessary to insure that the conditions of the various governmental permits are followed by NTPC and all their contractors/subcontractors. Continuous government surveillance will also enable on-site evaluations by government personnel to make additional restrictions or delete unnecessary permit requirements as the site specific conditions change or warrant. This minimizes environmental problems and actually speeds pipeline construction.

One additional note: NTPC should have environmental QC inspectors with stop work authority to enforce governmental mandated environmental stipulations. Reference the Environmental Stipulations attached by the U.S. Congress to the Grant and Agreement of ROW for TAPS.

Page 1-41. Pipeline Construction.

NTPC is requesting a permanent ROW of 75 feet plus an additional 15 feet of temporary ROW for a total disturbed width of 90 feet. This is very wide. APSC has a TAPS permanent ROW of 54 feet and the actual construction ROW was in most cases limited to that amount. NTPC states in their DPA but not in their BLM EIS, that "Narrower widths will slow construction process, increase costs, and aggravate the potential for accidents." NTPC should be requested to prove this claim and to submit data to substantiate their need for the requested ROW width.

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How will the ROW be cleared? By Hydoax? By hand clearing? The latter should be done within 100 feet of all water bodies. What will be done with the debris? How much of a civil effort will be needed? How much WP will have to be built on unstable soils? How many MS will be needed? Where will these be located? The picture on page 1-42 shows a cat simply pushing over trees and tearing up the soil. This was not allowed on the TAPS and should not be permitted if NTPC is allowed to build their proposed pipeline.

Figure 1.4-11 on page 1-43 is entitled, "TYPICAL PIPELINE CONSTRUCTION SPREAD" in large capital letters while below in fine print it is stated "not drawn to scale". This figure depicts most of the standard pipeline construction procedures from clearing to final cleanup on one page. This presents the viewer with the entirely false impression that construction activity will be limited to a very short segment of pipeline ROW at any one specific time. This is entirely false. A typical pipeline construction spread is often simultaneously working on a 10-20 mile or greater section of ROW (see BLM's estimate of 8-16 miles for 2 weeks to 1 month on page 3-56). This BLM figure should be omitted because it is deceptive. If this figure is retained, the "not to scale" should be in large capital letters like the figure's title, plus it should also state, in large capital letters, that a "typical pipeline construction spread" often occupies 10-20 miles of ROW. Pipeline construction is not as nice and neat as this BLM figure (quoted from the NTPC) would have one believe.

Page 1-44.

BLM states that all the pipe will be coated, but BLM does not say what coating will be applied. This is a very important consideration because some pipeline coatings work better than others and this in turn affects the long term oil spill frequency rate due to corrosion of that pipeline.

Figure 1.4-12 on page 1-45.

NTPC's drawing shows padding under the pipe (according to specifications). What are these specifications and where will the padding come from? What are the locations of the needed MS? The extraction of gravel from flood plain or in-river material sites caused very serious short and long term environmental problems on the TAPS. (Reference JFWAT Special Report Number 13 on MS site selection and operations.)

Under the column titled "Crossing of Water Courses", NTPC states that the width of the ditch at the bottom of RX is 76 to 78 inches" with implied near vertical ditches walls. From TAPS experience, this is incorrect since ditch wall slough or erosion by flowing water, plus the natural angle of repose of the sub-stream bed material caused RX ditches to widen greatly at the top and bottom. On the TAPS RX at the Chena River where that river was only 300 feet wide, the excavated ditch approached 100 to 150 feet wide at the top before the ditch was excavated deep enough for proper (below depth of project design scour) pipeline burial. (Reference JFWAT Section III Surveillance Reports.)

Figure 1.4-13 on page 1-45.

DOT regulations require that all pipelines be buried at least 48 inches below the river beds. On page 1-18, BLM indicates that the Northern Tier Pipeline would be buried below the depth of scour at all river crossings. Often the depth of scour is greater than the 48 inch minimum cover requirement. How deep the pipeline would be buried below the rivers will determine in part how much material must be excavated to obtain the necessary ditch depth which in turn affects the amount of silt that buried RX's will generate. The more digging in the riverbed, the more siltation, and the greater the impact on downstream aquatic resources. However, the pipeline must be buried below the maximum scour depth so that the pipeline would not be exposed and subjected to rupture during flood conditions.

Page 1-44 and 1.46.

BLM states "RX will be constructed in accordance with the requirements of the permitting agencies and sound engineering practice." Underlining is the reviewer's. What does this mean? Would NTPC directional drill all RX's if so required by the various government permitting agencies? BLM indicates that during RX excavation NTPC's backhoes, draglines, or the like will operate in the water. This should not be allowed due to fuel, grease, and hydraulic leaks that would directly enter the water. NTPC wants instream storage of excavated material at RX's. This should not be allowed, as it restricts the stream flow channel and causes additional siltation. The USACE does not allow the instream storage of excavated material. If necessary, you can use a suction dredge and pipeline to move the excavated material to shore storage. Where physically possible, NTPC should be required to flume or by-pass pump all small streams while they are installing their pipeline under those waterways. BLM states that NTPC plans to dewater, with well points, sand bottom streams carrying subsurface water to permit a dry excavation during pipeline crossing.

1) How will this effect downstream aquatic resources that are dependent on this subsurface flow?
2) What will be done with the water?

BLM indicates that stream bottoms of solid rock will require blasting. The shock waves that are generated by blasting will kill fish and other aquatic organisms. Underwater drilling and blasting was not done on the TAPS. I suggest a bored or aerial RX at these sites. With the number of major and minor RX's NTPC has to do in Montana, and with the equipment and manpower figures NTPC has presented, I seriously doubt that NTPC can clear the ROW at RX's, weld pipe, x-ray, coat, concrete coat, hydrotest, excavate, pull pipe, backfill, and do restoration with the time limits (8 to 12 months total; 1 to 3 months use at each RX) that NTPC has presented. This is especially true when one considers that all stream crossings work will most assuredly have to be performed within Montana Fish and Game Department approved critical timing windows and at low stream flows to make the physical aspects of construction easier. From TAPS experience, you need a detailed site specific RX plan for each RX plus a site specific RX restoration plan.

Page 1-46.

How does NTPC propose to install their pipeline in flood plain situation? Excavation in most flood plains will result in a ditch full of water due to groundwater flow into the excavated area even if the surface watercourse is not entered. On the TAPS, this type of construction caused major environmental problems because APSC wanted to dewater the ditch before lowering in the pipe. The silty water was pumped from the ditch and in a flood plain situation, it was difficult, if not impossible, to keep this silty water out of the adjacent watercourses which often resulted in the siltation of sensitive fish streams.

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Page 1-47. Hydrostatic Testing.

This section does not tell you how the hydrotest would be done. There is no mention of 1) water sources, 2) length of test segments, 3) discharge points, etc., etc., etc. A detailed hydrotest plan is needed. Hydrotest water should not be discharged into waterways because 1) there is oil and grease inside the pipe (and in the discharge water--reference TAPS Data on the Salcha River hydrotest) from the internal mandril of the pipe bending machine, 2) rust, 3) dirt, etc. You also must have an energy dissapation system controlling the discharged hydrotest water to prevent all erosion. Water removal for hydrotest uptake may be critical during low stream flows especially when on considers irrigation withdrawals. On the TAPS, APSC was not permitted to withdraw more than one-fourth of the actual stream flow. How will NTPC's water withdrawals for hydrotest mesh with Montana water laws and water ownership rights? Especially low flows that are left in the watercourses to maintain the fisheries resources?

APSC did not move hydrotest water from section to section for any great distance. It was fill/dewater, fill/dewater over and over again. In the TAPS Section III hydrotest for 156 miles of pipeline, there were five water sources and approximately ten discharge points. APSC wanted several more water intake sources, but APSC's request was denied due to insufficient stream flows or because instream excavation would have been needed on the smaller streams for placement of the hydrotest pump intakes. APSC wanted the water to be a minimum of six feet deep at all withdrawal points for their withdrawal pumps to properly function. NTPC states that they will "cleanup" their hydrotest water before discharging that water into watercourses. How does NTPC propose to "cleanup" this water?

Page 1-47. Restoration.

These should be government approved restoration revegetation specifications. The reclamation specifications should also apply to all private land unless the landowner specifically objects; as was done on the TAPS. NTPC needs to institute erosion control measures during construction. These procedures should be planned before any construction begins. On the TAPS, APSC had a system of "greensheets" for each homogenous portion of the pipeline system. APSC had hundreds of site specific erosion control and/or restoration greensheets or plans. These plans were necessary for government review and approval and because QC personnel need a plan to QC to. Everything must be in writing for verbal agreements are subject to misunderstanding. Reference TAPS Stipulations, APSC Erosion Control Manual, APSC greensheets and APSC QC Manual.

In NTPC's "Preliminary Construction Schedule", figure 1.4-10 on page 1-38 under the heading Pipeline System, all pipeline construction is to be done between April 1, 1980 and December 1, 1980 with "system testing" scheduled for April 1, 1981 to July 1, 1981. Does this mean that the hydrotesting will be delayed until 1981? If so, NTPC will not want to do any restoration or vegetation until after hydrotesting since they must traffic the ROW during hydrotesting. This could result in serious erosional problems, as well as pose access problems across rivers and creeks. In addition, if hydrotesting is done in the early spring when the ground is still frozen, NTPC would probably have to add antifreeze, methanol or heat to the hydrotest intake water to keep that water from freezing inside their pipeline. Antifreeze or methanol would effect the water quality and prevent that water from being discharged without treatment to remove the methanol or antifreeze. Heating the intake water could cause thermal pollution effects when that water is discharged.

Pages 1-48 to 1-50. Operations and Maintenance.

BLM does not specifically discuss NTPC's leak detection system. What is the minimum detectable leak? That is to say, at what rate can the pipeline leak oil into Montana's environment without this being noticed by NTPC's remote leak detection system? DOT requires an aerial pipeline surveillance flight every two weeks. NTPC then states, "Areas where leaks may have developed can also be spotted by the line flyer . . .". This leaves some doubt as to the reliability of the NTPC's leak detection system.

How is the NTPC man on the ground who finds a crude oil leak going to be able to contact the necessary people immediately? On the TAPS, APSC has a communication system with their own relay towers where any APSC employee with a mobile unit can talk to anyone else on the 789 miles of the TAPS. APSC's mobile system also connects with the telephone system. That is to say, a man in the field can, via his mobile radio, direct dial any phone number in Alaska. A communication system is extremely important in generating the quickest possible response to an oil spill. This in turn allows for containment of the oil in the shortest possible time thus minimizing the environmental damage of that particular oil spillage.

Table 1.4.23, Page 1-51; Table 1.4-24, page 1-52; and Table 1.4-26, page 1-53 all present estimates of construction costs. The last cost item in each of these tables is very misleading. It is listed as "Environmental Studies, Engineering, and Construction Management", thereby implying that the majority of that line item cost is for Environmental Studies. This is not true. Most of the total for this line item will not be spent on Environmental Studies but on Construction Management or Engineering. This line item should read, "Construction Management, Engineering and Environmental Studies."

Page 1.54.

The tariff rate from Port Angeles, Washington to Minneapolis, Minnesota is listed as $0.184. How can this be when the tariff rate to Clearbrook, Minnesota would be $1.014 plus the tariff on the Minnesota Pipeline $0.170 = $1.184 not $0.184.

Pages 1-54 to 1-56. Oil Spill Contingency Plan.

APSC submitted a detailed 15 volume mainline oil spill contingency plan to APO and SPCO about 180 days prior to scheduled pipeline start-up. APSC's plan was then reviewed by all the government monitoring agencies and recommendations or corrections to APSC's plan were made. In some instances, APSC's preliminary oil spill contingency plan showed their oil flowing uphill from hypothetical pipeline breaks. Mainline oil spill contingency plans must be site specific, adequately detailed, and should contain many technical requirements, such as predesignated containment and booming sites on watercourses.

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After APSC's mainline oil spill contingency plan was tentatively approved by APO and SPCO, the government ordered APSC to demonstrate their capability and readiness to execute their plans. The government's test involved simulated oil spills. The government notified APSC that the government would simulate a mainline oil spill within a segment of the pipeline during a certain week. APSC was not informed of the exact location or time of the government's test. For the actual test, the government called up APSC and told them that they had a break in their line somewhere in a 200 to 300 mile section. APSC then initiated their oil spill plan sending out helicopters, aircraft, and ground reconnaissance units. Government officials had marked the location of the simulated oil spill in the field by using black plastic on land and a green non-toxic dye in affected waterbodies. The government monitored and recorded APSC's detection time, response time, adequacy of simulated containment, and the like. In this manner, the government field tested APSC's oil contingency plan and APSC's implementation of that plan.

It is the policy of the U.S. Government that there should be no discharge of oil upon land or water during the life of the TAPS. This included construction. At the direction of APO and SPCO, Alyeska published a Construction Oil Spill Contingency Plan. APSC's government approved plan contained the names, addresses, and phone numbers of APSC personnel who were responsible for construction oil spill containment and cleanup. APSC's plan also listed the types of oil spill cleanup equipment that were kept in various pipeline construction camps and pump stations. APSC's plan also described basic oil spill containment methods and techniques.

During construction of the TAPS, APSC spilled large volumes of oil upon Alaska's environment. Estimates of the volume of petroleum spilled vary from 535,058 gallons to over 2,000,000 gallons, but the exact figure will never be known because of the nature of some of the spills, inadequate reporting and other problems.

In this regard, it should also be remembered that four major oil spills occurred in the first month of operations of the TAPS; a pipeline that was supposedly designed, engineered and built not to leak once in its 30 year projected lifeline. During startup, APSC experienced a human error coupled with a design failure as the crude oil reached pump station #8 that caused an explosion which completely destroyed the pump building and cost the life of one person. At pump station #9, a different design failure - human error problem resulted in the shutdown of that pump station when crude oil flooded the pump building and flowed out the door. On the north slope, a front-end loader operator backfilling around check valve #7, struck a 2-inch bypass pipe on that check valve and approximately 50,000 barrels of crude oil escaped to cover the tundra. One month later, crude oil was discovered in Washington Creek north of Fairbanks. Upon investigation, APSC discovered that the bolts on check valve #64 had never been properly tightened and that 50 to 150 barrels of oil per day had leaked out of the TAPS undetected for 30 days until that oil was discovered in Washington Creek.

Pages 1-56 to 1-58. Additional Measures Proposed for Environmental Protection.

The NTPC presented BLM with a list of 34 mitigating measures that it would institute. BLM lists these 34 measures and then presents a short one or two sentence discussion on the anticipated effectiveness of these mitigation methods.

1. Not applicable to Montana - NA.
2. NA.
3. Paint all storage tanks and landscape PS.
4. One Environmental QC per section. This is not enough; at least 2 or 3 are needed. Environmental QC must have stop work power.
5. Restoration - NTPC states that "yes, we will restore the ROW". This is not specific enough, lacks detail. Where is the enforcement power?
6. NA.
7. NA.
8. NTPC proposes to survey their pipeline route anywhere from a few months to several days prior to construction (DPA). Here NTPC states that they will retain archaeologists to evaluate the previously undisturbed portions of the ROW for things of archaeological significance after surveying that ROW but before construction. This does not appear to allow much time for the archaeologists to do their work.
9. NTPC proposes to reroute or reschedule pipeline construction if #8 identifies an archaeological site that cannot be recovered in time to permit pipeline construction. This would be effective only if adequate time is allotted in #8 above.
10. Landscape all mainline valves.
11. Water dusty ROW during construction in urban areas.
12. Use blasting mats to limit blast throw. I believe that this is an OSHA regulation.
13. Provide settling ponds as needed to reduce siltation of streams.
14. NA.
15. NA.
16. NA.
17. NTPC will route pipeline to produce the minimum number of RX's. This is sound engineering practice.
18. NTPC will route pipeline to avoid recoverable coal resources.
19. NTPC will route pipeline to avoid Little Missouri River and Missouri National Grassland.
20. NTPC will route pipeline to avoid crossing the Yellowstone River.
21. NTPC will compute depth of scour at each RX prior to construction. This is sound engineering practice.
22. NTPC will avoid rivertraining structures and rip-rap. These cost money and hence it makes economic sense to avoid them if possible.
23. NTPC will follow all DOT codes and regulations. NTPC has to do this, by law.
24. NTPC will reroute the pipeline to avoid ecologically sensitive areas. Who will determine what is an avoidable ecologically sensitive area? Biologists from regulatory agencies should provide this information.

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⑪ 25. "NTPC will provide advice and assistance to county and local governments to identify government programs (e.g., the Energy Impact Program) or other means under which grants, loans, or other income sources are available to energy impacted communities, and will assist, where necessary, in the application for these grants and loans. Anticipated effectiveness: The fiscal impact of the construction and operation of the NTPC facilities on local governments will be partially or totally mitigated by this means, at the time during which the fiscal impacts are experienced." NTPC's social impact mitigation measure is of minimal value and BLM's anticipated effectiveness is incorrect. NTPC would help local governments seek money from the State or Federal governments to pay for the social impacts caused by the NTPC. What if the State or Federal Government has no money? (Remember California Proposition 13.) How would this then mitigate the adverse social costs of the Northern Tier Pipeline?

26. "After the completion of the environmental impacts assessment process and permitting of the project, and prior to construction, NTPC will coordinate with the appropriate state officials or local planning agencies in each locality, to establish the availability of local labor and the potential for immigration of construction workers and their families and to establish the availability of housing for these persons. NTPC will arrange for development of a temporary housing plan and for the provision of temporary housing, preferably by local private persons or concerns, to meet the needs of the construction work force and their families. Anticipated effectiveness: To ensure ordered and planned housing of construction workers and their families and to minimize disruption of ongoing housing patterns in each locality." In their DPA but not in BLM's EIS NTPC states, "Construction and supervisory personnel will generally be housed in existing local facilities. Travel trailers may be used by some contractor's personnel for housing, but existing trailer parks will be utilized for accomodating these units." Questions: Where are these to be found in the rural areas NTPC intends to cross, especially in eastern Montana? People "just camped along the road" will generate a wide range of environmental problems such as sanitation, sewage, garbage which attracts animals and could increase the rabies problem, disturbance to wildlife, poaching, off road vehicle use, and much more.

27. NA.
28. NA.

Six measures duplicate other portions of the NTPC application and these were not discussed by BLM.

Page 1-58.
West Coast surplus is stated as 450,000 bpd; on BLM page 1-4, it is listed as 500-600,000 bpd for 1978 and 1,000,000 bpd by 1985.

Page 1-59.
Two competing proposals have been filed under the Public Utilities Regulatory Act of 1977; Kitamat and Foothills Pipeline. BLM needs to address this situation.

## Chapter 2. Description of the Environment.

Pages 2-1 through 2-47 on the marine terminal were not reviewed.

Page 2-47. Pipeline System.
This entire section is generally descriptive with few detailed facts.

⑫ On page 2-57, BLM states that scour depth for NTPC RX are based on NTPC field inspections in 1978. Table 2.1.2.6-6 on page 2-65, "Characteristics of Major River Crossings - Columbia Basin" lists NTPC scour depths of the major RX's in western Montana. How did NTPC arrive at its scour depth figures? What estimating techniques did NTPC employ? Are the scour figures the average scour depth or the estimated scour depth for the 50 year flood, hundred year flood, or what? This is extremely critical because the proposed pipeline must be buried at least 48 inches beneath the maximum flood scour depth or it would be exposed when that river floods.

Table 2.1.2.6-10 on page 2-71, "Characteristics of Major River Crossings - Missouri Basin" also lists scour depth measurements. The Big Dry Creek RX at pipeline mile 968 is listed as being zero feet wide, zero feet deep, zero velocity and having a scour depth of zero; but at the 100 year flood this crossing is estimated to be 250 wide. What this appears to mean is that when NTPC's consultants visited this RX on Dry Creek in 7/78 it was in fact dry with a scour depth of zero since there was no flowing water. If this is how NTPC estimated all their scour depth data, it is of little value in determining how deep the proposed pipeline should be buried at RX's (Also see comment on Figure 1.4-13 on page 1-45).

⑬ Table 2.1.2.6-6 lists only 12 major RX in the Columbia Basin but NTPC lists 20 major RX on pages 1-21 and 1-22. There is no discussion or information presented on the RX's on the Thompson River, two crossings of the Little Bitterroot River, North Fork Jocko River, and Middle Fork Jocko River. All these tables on RX's are misleading in that they give the casual reader the impression that there are fewer major RX's than there would in fact be if NTPC is permitted to undertake the project. These BLM tables should be revised to include all the major RX's.

Pages 2-78 to 2-88. Biological Components of the Aquatic System is extremely weak with practically no detailed information on Montana's rivers and streams. This is especially true of Table 2.1.2.6-17 "Fish Occurrence and Fishery Value in Selected Streams Within Major Drainages" as few rivers are covered and almost no meaningful data is presented.

Section 2.1.2.8. Terrestrial Vegetation.
BLM has provided a general discussion of the vegetation types crossed by NTPC proposed pipeline.

⑭ Section 2.1.2.9. Terrestrial Wildlife.
In a very general discussion, this section only addresses "Endangered Species" and "Areas of Special Concern". Other wildlife resources are not mentioned. On page 2-101, Bitterroot River should be changed to Little Bitterroot River (see comment on page 1-18).

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Section 2.1.2.10. Cultural Resources.
General discussion of archaeological and historical resources.

Section 2.1.2.11. Visual Resources.
General discussion.

Section 2.1.2.12. Land Use.
General discussion. It is impossible to make specific comments and/or review when very few specifics are presented by BLM for consideration.

Section 2.1.2.13. Transmission and Utility Networks.

Section 2.1.2.14. Recreation Resources.

Section 2.1.2.15. Social and Economic Conditions.

Section 2.2.2. Future Environment - Pipeline.

## Chapter 3. Environmental Impacts of the Proposal.

Pages 3-1 to 3-55 on the marine terminal were not reviewed.

Page 3-57. Table 3.2.2-2.
BLM's fugitive dust estimate of 7700-11000 lb./day/per 5 mile working section may be conservative depending on soil type, precipitation, and the like. Dust will effect vegetation and in turn that vegetation's use by livestock or wildlife, as well as adding to particulate pollution of the air.

On page 3-59 BLM states, "Excavating and grading for the pipeline could block or divert small surface drainages and result in minor impacts of short duration, 5 years or less." The only way a drainage block or diversion would be of short duration would be if it eroded out in BLM's given five years. This degradation of the environment is unnecessary. Adequate drainage structures should be installed, and the ROW should be cleared and graded in a manner that would not alter surface drainage patterns. Reference TAPS Stipulations and TAPS experience.

⑮ On page 3-59, BLM states, "This impact would be most severe along the major streams, including the Columbia, Missouri, and Musselshell Rivers, because of their high streamflows." The Musselshell River is listed by BLM on Table 2.1.2.6-10 as having a maximum recorded flow of 16,000 cfs with an average discharge of 268 cfs. BLM's Table 2.1.2.6-7 lists the Clark Fork River as having a maximum discharge of 134,000 cfs with an average flow of 20,140 cfs. The Northern Tier Pipeline would cross several rivers "larger" than the Musselshell. BLM is not consistent in their presentation of this data.

On page 3-65, BLM states, "Revegetation of unpaved areas would be complete or well underway by the growing season following construction." Permanent erosion control measures should be implemented immediately after the pipe is buried to minimize environmental damage. The entire ROW should be stabilized by the winter of the construction season to minimize damage during the following spring breakup. Disturbed areas can be dormant seeded, as APSC did on some portions of the TAPS.

On page 3-65, BLM states, "Terrestrial oil spills and pipeline leaks would contaminate soils, reduce their productive potential, and increase their susceptibility to erosion. Pipeline spills would occur at an estimated frequency of 0.0022 spills per mile per year (OTW 1978). This is based on spills greater than 2.4 barrels (100 gallons). In terms of total length of pipeline, about 68.5 spills would occur in 20 years. A leak too small to be detected by remote sensing equipment could amount to as much as 3,540 barrels per day, assuming a throughput of 709,000 barrels per day. Soil contamination from this type of leak would continue until it was detected visually and stopped."

This means that if NTPC is permitted to build their pipeline, 3,540 barrels per day or 148,960 gallons per day could leak out of their pipeline on Montana's environment forever undetected by NTPC's remote sensing equipment. A leak of this size would go unnoticed by NTPC until a private citizen discovered the oil flowing over Montana's landscape or until that break was discovered by a NTPC line flyer. The line flyer would operate once every two weeks (page 1-49) so 3540 x 14 = 49,560 barrels or about 2,500,000 gallons could leak out undetected between line flights. If the leak was under 2-4 feet of snow, a common occurrence in Montana, it could leak all winter and the line flyer would never see it and NTPC would be unaware of the environmental damage until the spring's snow melt.

⑯ In addition, this 3540 bpd figure or 0.5 percent of the 709,000 bpd throughput, is not the current state of the art in pipeline leak detection technology. The TAPS automatic, remote sensing leak detection system was supposedly designed to detect a leak of 500 bpd at 2,000,000 bpd throughput or 0.03 percent. APO officials have indicated that the TAPS automatic leak detection system is, in actual practice, only able to detect a leak of about 1000-1200 bpd at 1,160,000 bpd average throughput or 0.09 percent to 0.10 percent. If NTPC is permitted to build their project, they should be required to install the best pipeline leak detection system that is presently available. The TAPS experience would be a good example.

⑰ On page 3-67, BLM states that they expect 2 to 6.5 cubic yards of sediment per foot of stream channel width to be washed downstream during excavation at waterway crossings. This figure needs to be compared with the sediment transport figures obtained for the TAPS Salcha River Crossing (reference Mr. Kim Francisco's JFWAT Special Report Number 17). At least 1,166 tons of suspended sediment were introduced to the Salcha River during the 17 days of pipeline installation. The Salcha River was approximately 300 feet wide during TAPS installation; 3.9 tons of sediment were generated per foot of pipeline crossing.

⑱ On page 3-67, BLM states that the hydrotest withdrawal rate would be 6 cfs or 2700 gallons per minute. This figure should be checked against the TAPS hydrotest withdrawal rate. BLM indicates that NTPC may want to add soda ash and/or a bacteracide to their hydrotest water to reduce internal pipe corrosion. This would effect hydrotest discharge water quality and is another reason why hydrotest water should not be discharged directly into watercourses. BLM states that they see no problem discharging hydrotest water directly into streams. As previously discussed (reference JFWAT Surveillance Reports and Analysis of Salcha River Hydrotest Water), there

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⑱ is a problem of oil in the discharge water. This oil comes mostly from the hydraulic leaks associated with the internal mandril that is used in the pipe bending machine. BLM did not address this problem; BLM says none exists, which is an error.

⑲ Table 3.2.6-1 on pages 3-68 and 3-69. "Estimated Sediment Increase Construction."
How did BLM obtain their estimates of trench length, trench width, trench depth, trench volume, and sediment increase? Is trench depth calculated from the top of the water surface or the top of the river bottom? BLM's "stream velocity" column is given in cfs and as such should be titled stream discharge not stream velocity. The "data" that BLM has presented in this Table appears to be incorrect. The Clark Fork River "data" will be used as an example though the following comments are applicable to the entire Table. There are 5 proposed buried crossings of the Clark Fork River in Montana; at pipeline miles 533, 538, 539, 540, and 553. The Clark Fork flows from East to West and 533 is the downstream crossing. BLM lists the five Clark Fork River crossings as having discharges of 10,000 cfs, 5,000 cfs, 1,000 cfs, 1000 cfs, and 10,000 cfs. The 533 crossing downstream is listed as having a discharge of 10,000 cfs while the uppermost crossing at mile 553 is also listed as having a discharge of 10,000 cfs. The Thompson River and a few small streams enter the Clark Fork between mile 553 and 533, yet BLM claims that the discharge is identical. Unless there is a water loss from the system this is impossible. Above the Thompson River, the Clark Fork River breaks into three channels separated by islands. These are the 538, 539, and 540 RX's. BLM lists the discharge of these three channels as 5,000, 1,000, and 1,000 cfs for a total 7,000 cfs yet BLM lists the 533 and 553 RX crossing at 10,000 cfs. What happened to the 3,000 cfs difference in these figures. These discharges for the Clark Fork are also not similar to the discharge data BLM presented in Table 2.1.2.6-7. In this Table, BLM lists the five Clark Fork RX's as having lengths of 625, 600, 350, 500, and 600 feet respectively. However, Table 2.1.2.6-6 states that the Clark Fork River is 650, 850, 550, 675, and 675 feet wide at these five crossing sites. How does BLM propose to install the RX's when their trench lengths are less than the actual widths of the river? In normal pipeline RX construction the pipe RX trench is usually 100 feet or more longer than the width of the river at the RX.

How did the BLM "estimate" the trench volume—or the amount of river bed material that would have to be removed during RX construction?

OEA TABLE ON ESTIMATED RX TRENCH VOLUME

| Clark Fork Crossing | BLM Trench Length-Feet | BLM Trench Depth-feet | BLM Trench Width-feet | BLM Trench Volume Cubic Yards | Vertical Walls*** | Ditch Wall Slope 1:1 | 1:2 | 1:3 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | in cubic yards | | |
| 533 | 625* | 25 | 6.5 | 8264 | 3761 | 16,348 | 30,016 | 43,547 |
| 538 | 600 | 20 | 6.5 | 5644 | 2883 | 10,331 | 18,222 | 28,111 |
| 539 | 350 | 15 | 6.5 | 2175 | 1264 | 3,549 | 6,465 | 9,382 |
| 540 | 500 | 13 | 6.5 | 2667 | 1565 | 3,912 | 7,042 | 10,171 |
| 553 | 600 | 22 | 6.5 | 6511 | 3178 | 12,344 | 23,100 | 33,855 |
| 533 | 650** | 25 | 6.5 | 8264 | 3912 | 17,002 | 32,047 | 45,289 |
| 538 | 850 | 20 | 6.5 | 5644 | 4092 | 14,639 | 27,231 | 39,824 |
| 539 | 550 | 15 | 6.5 | 2175 | 1986 | 5,576 | 10,159 | 14,743 |
| 540 | 675 | 13 | 6.5 | 2667 | 2112 | 5,291 | 9,506 | 13,731 |
| 553 | 675 | 22 | 6.5 | 6511 | 3575 | 13,887 | 25,988 | 38,088 |

*Data in this column is from BLM Table 2.1.2.6-7.
**Data in this column is from BLM Table 2.1.2.6-6.
***Calculated trench volume assuming vertical ditch walls, ditch walls at 1:1, 1:2, and 1:3 slope.

In the above OEA Table, it was assumed that the bottom of RX pipe trench was about 6.5 feet wide, a reasonable assumption that would leave only about 1.5 feet on each side of the 40" OD pipe when it would be placed in the RX pipe trench. If the natural angle of repose of the stream bed material would allow vertical ditch walls, only about one-half the BLM estimated trench volume would have to be evacuated from the river. But if the natural angle of repose of the stream bed material was 1:1, 1:2, or 1:3, the amount of stream bed material that would have to be excavated would be approximately twice, four times, and five times the BLM estimate.

⑳ BLM trench evacuation estimates do not account for the volume of material that would be washed into the excavated area by the flowing river which would also have to be removed to obtain the proper ditch depth. On the TAPS, the natural angle or repose of stream bed material excavated at RX's varied from 1:1 to 1:4. The Chena River at the TAPS crossing outside of Fairbanks is 300 feet wide. The excavated RX ditch was about 600 feet long due to the possible lateral migration of the Chena River during the TAPS' lifetime. The Chena pipe ditch was approximately 25 feet deep. Due to a natural angle of repose of the Chena River bed material that approached 1:4, the width of the pipe trench at its top was in excess of 150 feet while it was still only eight feet wide at the bottom. APSC had originally stated that it would take their Execution Contractor ten days working 24 hours a day to excavate the Chena RX. It took the Execution Contractor 27 days working 24 hours a day to actually excavate the Chena pipe ditch. The BLM does not appear to be realistic in their estimates of the amount of in-river excavation and river disturbance that would be associated with the proposed Northern Tier Pipeline river crossings.

㉑ How did BLM obtain the estimate of Sediment Increase (in ppm) during RX construction. On the five Clark Fork RX's, BLM estimates the sediment increases as 20 ppm, 110 ppm, 470 ppm, 540 ppm, and 50 ppm. At what distance below the RX did BLM make these projections? The 20 ppm and 50 ppm figures appear to be underestimated. The river bottom may be gravel, cobbles or sand, but below this natural armouring layer silts and clays are packed around the larger material.

The Salcha River at the TAPS crossing southeast of Fairbanks has a gravel, cobble bottom, King salmon used to spawn right at the crossing. During RX construction at the Salcha River, the Alaska Department of Fish and Game and the USGS collected water samples to try and determine the effects of the TAPS buried RX. This data was published in JFWAT Special Report #17. During RX construction of the Salcha River the actual measured suspended sediment values range from 1-8 ppm above the pipeline crossing, 10-648 ppm 450 feet below the RX, 15-504 ppm at 1,450 feet below, 40-115 ppm

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at one mile, 25-115 ppm at 1½ miles, 14-79 ppm at three miles and 7-40 ppm at eight miles below the Salcha River TAPS crossing. The low suspended sediment values below the crossing correlate with construction inactivity, and the high values were associated with ditch excavation.

㉒ Table 3.2.6-2 on page 3-70, "Maximum Potential Oil Spill" is calculated on the length of pipeline below the rivers between valves. If you have a river crossing, then a valve, followed by a five mile long hill with no additional valves, and the pipeline broke just on the downflow side of that valve, five miles of pipeline would drain onto the riverbanks and most probably into the river. In this Table, BLM also lists "minimum detected spill" with ranges from 490 bpd to 6360 bpd with the average of the 48 listed RX being 1845 bpd. However, on page 3-65, BLM states that the minimum detectable spill would be 3540 bpd. These two BLM statements do not appear to be compatible.

㉓ On page 3-72, BLM states, "Sediment would slightly reduce the production of cold water fishes (salmon and trout)." "Sediment would cover spawning gravel and smother eggs incubating in the gravel for a short distance downstream from the crossing and smother eggs incubating in the gravel." "Most of the sediment would be washed out of the gravel during the first period of high flow consequently one year - class of fish (eggs of fish of the same age) would be most heavily impacted. Subsequent spawning runs of these populations would be reduced for several cycles but probably within the range of normal fluctuations. Consequently, the reductions would not be noticed. . ." "Some insect populations would also be lost in the impacted area and fish normally feeding there would be displaced to other areas of the stream." "Oil would clear rapidly from streams. . .". The underlining in the above BLM quotations is the author's. BLM does not provide any sources, references, or data on which BLM based their conclusions. In the author's opinion, the BLM statements are in error. For example, the sediment washed out of the gravel from below any RX then settles only further downstream where it effects additional aquatic resources. BLM's contention that "oil would clear rapidly from streams. . ." neglects the fact that oil contamination of the stream side soil and vegetation results in long term oil "leakage" into that aquatic system. Reference Prospect Creek, Galbraith Lake, and other major construction spills on the TAPS.

In an October 30th, 1978 letter from Mr. Robert H. Torheim, Regional Forester, Northern Region, Missoula, Montana, to Mr. Albert F. Lachard, Northern Tier Project Manager, BLM, Portland, Oregon, Mr. Torheim transmitted the official USFS review comments on BLM's preliminary Draft NTPC EIS. In his letter Mr. Torheim stated,

> "Cumulative or synergistic results of several individual impacts are not discussed. An example of this is the fisheries discussion. Individual impacts relating to turbidity, sediments, loss of food source, etc., are discussed and generally noted as being of minor magnitude and duration. However, all of these stresses placed on a fish population and its habitat at the same time may be very detrimental to existing and future populations.
>
> "Sediment production impacts are not limited to the stream crossings and immediate downstream areas. These sediments are going to be continually washed downstream for several years, eventually settling in such places as reservoirs."
>
> "In summary, we feel the environmental impact statement must contain the information necessary for the land managers and public to thoroughly understand the impacts and trade-offs associated with this major project."

It appears that BLM did not heed the advice of the USFS in the completion of the NTPC Draft EIS.

㉔ On page 3-72, BLM states that only low shrubs would be allowed to become reestablished on riverbanks. Why is this so? On the TAPS, APSC actually planted trees and shrubs at some of their river crossings. Why could APSC do this and NTPC not do it?

㉕ On page 3-72, BLM states, "Fish entering the pipe during water withdrawal (for hydrotest) would suffer 100 percent mortality. . .". This is unnecessary. All pump intakes should be surrounded by a three to four foot square, screen covered box. This pump screening technique was utilized on all the TAPS hydrotests. These large screened boxes prevent fish uptake and prevent fish from being sucked and held by pump suction against a small screened pump intake.

On pages 3-72 and 3-73, BLM states that construction oil spills would be of short duration and volumes would probably be limited to a few gallons or less. This is contrary to what was experienced during construction of the TAPS. APSC spilled between 500,000 and 1,000,000 gallons of petroleum products during construction. (Reference JFWAT Special Report #15.)

There are many ways to minimize fuel spills at RX's:
1) No equipment should be allowed to operate from in the water.
2) Equipment should be moved back 100 to 300 feet from the bank to be fueled or serviced.
3) Steam clean equipment before it works near water. If any equipment is ever allowed to be worked in water or to drive across streams, that equipment should be steam cleaned before it is allowed to get into the waterway. This was done on the TAPS.
4) Repair all hydraulic or oil leaks before that equipment gets near any stream.

㉖ On page 3-169, BLM states, "There would be no significant impact resulting from test water discharge." Underlining is the author's. Incorrect - see previous hydrotest comment on BLM page 1-47. Of course, this all depends on how "significant" is defined.

On page 3-75, BLM states, ". . .the loss of fish in a relatively short stream segment should not have a critical effect on the population." Reference previous USFS quotations on cumulative effects and long term sedimentation effects.

㉗ BLM does not discuss the adverse effects at small streams. In Alaska, these smaller streams are often more important to the entire fisheries resource than the main rivers. At certain times of the year these smaller streams are the spawning and rearing areas for the fish that later move back into the larger rivers. Just because a waterway lacks width is no reason to assume that small streams are not an important part of the fisheries ecosystem. On page 3-78, BLM states, "Sediment impacts to fish populations would be minor in

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㉗ streams containing little or no spawning habitat such as the Columbia River and the lower portion of the Clark Fork River." If this is true, these fish must then be spawning in the small side streams.

On page 3-78, BLM states, "A leak detection system capable of sensing a .5 percent loss of throughput volume would allow a leak under this limit to go undetected by the remote sensing system. A leak of up to 3,540 barrels per day with a throughput of 709,000 barrels per day and up 4,660 barrels per day with a 932,000 barrels per day throughput could occur and would continue until detected visually and stopped." See previous comments on BLM pages 1-54 to 1-56 and 3-65.

On page 3-78, BLM appears to be implying that the pipeline would have to break under a stream for oil to get into that stream. This is not true. The pipeline could leak oil into a non-fish containing watercourse which could then flow into a more sensitive fisheries resource area.

㉘ Section 3.2.8. Terrestrial Vegetation.
On page 3-80, BLM states that no herbicides will be used by NTPC to maintain their pipeline ROW. However on page 3-84 BLM states, "The corridor would be maintained by mechanical removal of woody vegetation supplemented by limited chemical control at approximately 5-year intervals." Again, the underlining is the author's. What are the standard industry practices for maintenance of pipeline ROW? The Yellowstone Pipeline Company should be consulted since their ROW crosses Montana along a route similar to that proposed by NTPC. How are the various powerline ROW's maintained in Montana? On page 3-80 they say no herbicides will be used and on page 3-84 they say herbicides will be used at 5-year intervals. This is contradictory.

On page 3-84, under the heading of "Endangered and Threatened Species", BLM states, "Although several such species probably inhabit the project ROW, no unique habitats are known to be within the corridor, and no adverse impacts are expected." Underlining is the author's. The lack of discovery does not mean lack of impact.

Section 3.2.9. Terrestrial Wildlife.
This section is also very general.

On page 3-84, BLM states, "The magnitude of disturbance impacts depends largely on timing." This is a very true statement - critical timing or allowable construction windows are the prime mitigating technique to reduce the adverse impacts on wildlife once a pipeline centerline has been selected. Figure 3.2.9-1 gives periods of sensitivity to disturbance of susceptible species.

㉙ On page 3-86 to BLM's list of construction phase impacts to wildlife should be added: 7. Poaching by construction workers. APSC did not allow any firearms (aside from authorized security personnel) on the TAPS project.

㉚ Table 3.2.9-2. "Potential Impacts to Wildlife on Areas of Special Concern." This Table does not appear to be comprehensive. Where did BLM get their "impact values"? For example, BLM does not mention open B/G ditch effecting wildlife - deer, elk, antelope and the like.

㉛ On page 3-93, BLM states, "Approximately 80 bighorn sheep in the Clark Fork River area (pipeline mile 529) would be disturbed. Construction activities and human intrusion are likely to cause the loss of one year's production of young. Ewes displaced from spring range and receiving harrassment or unusual disturbance might not obtain adequate nutrition for successful lambing." BLM appears to be willing to "write-off" one year's bighorn lamb production if NTPC is permitted to build this project. A solution that the bighorn's would be much more agreeable to would be to require NTPC to build this portion of the pipeline when that area was not critical to the bighorn sheep.

Section 3.2.10. Cultural Resources.

Section 3.2.11. Visual Resources.

Section 3.2.12. Land Use.

Section 3.2.13. Transportation and Utility Networks.

㉜ On page 3-110, BLM engages in a general discussion of the HVAC lines that would have to be constructed if NTPC is permitted to build their planned pipeline. BLM states, "O&M power use would represent significant load increases for a number of serving utilities." Where would the power needed by NTPC come from?

Also, on page 3-110, BLM discusses the relationship between HVAC and pipeline induced currents. This is an extremely important consideration in designing a cathodic protection system.

Section 3.2.14. Recreational Resources.

㉝ On page 3-115, BLM lists, "increased opportunity for access into remote or unwooded areas" as a positive advantage of the Northern Tier Pipeline. Many people would classify this as a negative impact for this would reduce that area's wilderness quality.

Section 3.2.15. Social and Economic Conditions.

㉞ Page 3-121. Housing.
BLM states, "A current study will address moving-site construction projects. Results will be presented later." On page 3-119, BLM states that 47 percent of the work force would be out-of-state people in construction sections 3-7. In Table 3.2.15-6 BLM lists 16-19 percent of the work force as being "local" within Montana.

On page 3-125, BLM states, "Impacts of antagonisms between community residents and pipeline workers would not be significant. Preliminary findings on past pipeline projects indicate that these workers have been generally well received by communities. Leisure time activities are similar and therefore not disruptive to community members and workers have tended to maintain an adequate social distance (Mr. West, personal communication, 1978)." This is contrary to Alaska's experience during construction of the TAPS.

CONT

Chapter 4. Mitigating Measures Not Included in the Proposed Action.

㉟ On page 4-1, BLM states, "Impact reducing measures proposed by the Northern Tier Pipeline Company (NTPC) but not included in the description of the proposed action and measures that government agencies explicitly stated they will enforce are termed 'committed mitigating measures.' Impacts that would remain after all 'committed mitigating measures' were applied are termed 'unavoidable impacts'. They are summarized in Chapter 5." "Presently available information on the proposal describes the pipeline route in terms of a 2-mile-wide corridor. The port and onshore storage facilities are described in terms of initial design specifications. This information is not sufficiently detailed to identify and quantify most site specific impacts. Federal, state and local agencies generally require more specific information on proposed locations, design of system components, construction, and reclamation methods, and operating procedures to determine what mitigating measures would be required under existing regulations and codes. Similarly, private landowners need more site specific details about the proposal in order to determine what measures they would require as easement provisions." Then why has BLM issued a Draft EIS?

The recommendations in this Chapter are general and are a good start, but there are many other mitigating measures that can be added. In addition, those BLM listed need to be expanded and detailed: reference TAPS, JFWAT, and APO documents plus previous comments. BLM provides a general discussion of critical timing at RX's, all fish streams, and wildlife areas. Reference JFWAT fish stream list for the type of data needed prior to any construction.

NTPC has proposed to locate the pipeline and related facilities to avoid vulnerable wildlife habitats. Avoidance of ecologically sensitive areas and habitat of threatened and endangered species could mitigate most of the impacts to wildlife resulting from habitat alteration and disturbance. The effectiveness of this measure depends on:

1) the criteria used to define sensitive areas. . .
2) who determines "vulnerable wildlife habitats" - NTPC? or the Montana Department of Fish and Game? This is one of the prime reasons why biologists must have input and veto power in the early pipeline routing and design.
3) Actual avoidance of those areas.

On page 4-6, BLM states, "Mitigation efforts will be two-fold including 1) planning procedures and 2) on-the-ground site specific analysis of development activities." The author agrees with this BLM statement; a continuous government surveillance effort will be needed for meaningful environmental protection if NTPC is permitted to build their planned pipeline system. BLM also states, "Planning stipulations will partially mitigate impacts by directing the appropriate agencies to require development activities 1) during less seasonally critical times to wildlife and 2) under minimum time schedules." An example of the latter would be to require NTPC to work 24 hours a day at RX's once an instream activity has commenced to minimize the time that the river is physically disturbed. Furthermore, BLM states, "On the ground mitigation will require the presence of a wildlife biologist during construction, operation, and abandonment activities. Mitigating measures could include 1) avoidance of impacts to previously unidentified nests, staging areas, and 2) coordination with construction supervisors to moderate disturbance to wildlife and wildlife habitat." This appears to indicate that BLM is proposing that there be continuous government surveillance with stop working authority if NTPC is permitted to build. The underlining in the above quotation is again the author's to stress a most important point, trained experienced biologists should make the biological decisions, not engineers and the biologists' work to be meaningful must have veto power over engineering decisions of mere convenience or money.

The Trans Alaska Pipeline System was constructed under provisions of the Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline entered into on the 23rd day of January, 1974 by the United States of America and seven owner companies that operated through the Alyeska Pipeline Service Company (APSC). General legal, management, organization and engineering requirements were set forth in the body of the Agreement and Grant. More specific requirements were detailed in five exhibits that were attached to the Agreement and Grant.

The State of Alaska entered into a right-of-way lease for the Trans-Alaska Pipeline with the Alyeska Pipeline Service Company that was modeled after the Federal Agreement and Grant. The State and Federal Stipulations were nearly identical and constituted an integral part of the respective U.S. Government and State of Alaska lease and grant for pipeline construction. These stipulations were part of the "Trans-Alaska Pipeline Authorization Act" (Public Law 93015)) passed by Congress and these stipulations were later translated into provisions of the Federal and State Grant/Lease. Congress incorporated these stipulations into law at the request of various political groups as a measure designed to mitigate the adverse effects of pipeline construction. Within these stipulations, were requirements for continuous government surveillance of the pipeline system with all government expenses reimbursed by the permittee/lessee, APSC. Congress decided that this condition was necessary to insure APSC's compliance with the conditions of their "Grant of Right-of Way". Continuous government monitoring and surveillance was the primary method utilized to mitigate the environmental disturbances associated with the construction of the TAPS.

The Federal Government through its Department of Interior Alaska Pipeline Office (APO), the State Pipeline Coordinators Office (SPCO) and the Joint Fish and Wildlife Advisory Team (JFWAT) monitored all phases of TAPS construction for four years. The TAPS involved the construction of a large diameter pipeline similar to the proposed Northern Tier Pipeline. There is a vast array of reports, documents and knowledge that is presently available on the TAPS experience. Why has the BLM not even mentioned the TAPS environmental stipulations that were attached by the U.S. Congress to the Alaskan Pipeline Authorization Bill? Many mitigating measures that Congress attached to their TAPS bill in 1974 aren't even listed, discussed, or evaluated by BLM. Why?

Chapter 5. Any Adverse Impacts Which Cannot Be Avoided Should The Proposal Be Implemented.

Pages 5-1 to 5-12 on the marine facility were not reviewed.

CONT

Page 5-15.
All the "unavoidable" adverse effects of open trench B/G RX's could be avoided by directional drilling all RX's. The use of flumes during B/G construction would also reduce the adverse impacts on smaller streams. On the TAPS, ¼ of the actual stream flow was used as the maximum allowable hydrotest water withdrawal rate as a means of limiting adverse effects due to water removal from the streams. The "unavoidable" adverse effects of an O&M line oil spill could best be mitigated by:

1) An adequate independent QC/QA during construction to insure that the pipeline is built according to all engineering specifications.
2) Prompt detection of oil spills; adequate leak detection system.
3) A detailed workable oil spill contingency plan with trained cleanup personnel and proper equipment.

On page 5-15, BLM states, "The pipeline must be buried 48 inches below 100 year flood scour depth to comply with DOT regulations." See previous comments on BLM page 3-67, Table 3.2.6-1, page 2-57, and Table 2.1.2.6-6.

Page 5-19.
Some ways to minimize, reduce, or eliminate adverse effects to wildlife:

1) Vegetation - leave undisturbed natural buffer zones along rivers, critical habitats and the like.
2) Construction activity restriction zones - critical timing.

Under Section 5.2.15, Social and Economic Conditions, some of the unavoidable impacts may be avoidable. BLM should review the Preliminary State of Alaska Social and Economic Stipulations for the soon to be built Alaska Northwest Gasline. BLM should also refer to the TAPS experience. APSC was required to build construction camps for all their workers. NTPC could be required to build construction camps along portions of the pipeline route that do not have adequate facilities.

Chapter 6. The Relationship Between Local Short Term Uses and the Maintenance and Enhancement of Long Term Production.

BLM states that none of these short-term uses are likely to have significant impacts on long-term maintenance or productivity of the resources. Not much new data is presented in this section.

Chapter 7. Irreversible and Irretrievable Commitment of Resources.

Very little is said in this Chapter and vitually no information is presented.

Chapter 8. Alternatives to the Proposed Action.

Section 8.1.1. No Action Alternative.

Section 8.3.2. Delayed Action Alternative.
These two alternatives are not favored by BLM because a) "must move surplus Alaska oil," b) "economic benefits", c) "national energy independence." See previous comments on BLM pages 1-3 and 1-4.

Section 8.4.1. Northern Tier Ports and Onshore Facilities Alternatives.
This section was not reviewed.

Section 8.4.2. Northern Tier Route Segment Alternatives.

Section 8.4.2.8. Nine Mile Creek - Helena.
This is the NTPC proposed route alternative to avoid the Flathead Indian Reservation. This route calls for 13 RX's of the Clark Fork and Little Blackfoot Rivers. Along Siegel Creek this route would go between Rare II areas 1-795 and 7-796, which are separated only by a road. These two study areas are recommended for wilderness classification only under the "all wilderness" alternative and are recommended for non-wilderness management under the other nine alternatives. However, the USFS could not issue a permit to NTPC until the Rare II study is completed.

Section 8.4.2.9. Nine Mile Creek - Helmville.

Section 8.4.2.10. Harlowton - Beach - Clearbrook.
This is a more southerly route proposed by NTPC with 15 major and 300 minor stream crossings.

In Table 8.4.2.11-1, BLM presents a comparison of environmental impacts on the route alternatives but BLM makes no recommendations as to the least environmentally damaging route.

Section 8.4.3. Port-Pipeline Alternatives.

Section 8.4.3.1. Alaska to Edmonton, Alberta (Foothills).
There are four proposals by Foothills:

1) Delta Junction,Alaska to Edmonton, Alberta, 500,000 bpd; 1,505 of new 30" OD pipeline to be built down the Alcan Corridor.
1a) Delta Junction to Key River, Alberta; 1,136 miles of new 30" pipeline.
2) Skagway, Alaska to Edmonton. The crude oil would move via tanker from Valdez to Skagway and Haines, Alaska where off loading facilities and storage tanks would have to be constructed. Then by 1,091 miles of new pipeline up and over White Pass, along Yukon Highway 6 to Jakes Corner, then down the Alcan Highway to Edmonton.
2a) Skagway-Key River, Alberta. This alternative is the same as 2 above but with the new pipeline ending in Key River, Alberta instead of Edmonton.

All four of these alternatives would connect with existing pipelines for transport of the crude oil to the U.S.

Section 8.4.3.2. Kitamat to Clearbrook, Minnesota.
Seven hundred fifty three miles of new 30 to 36 inch pipeline would be built from Kitamat, B.C. to Edmonton, Alberta. This plan would require a new tanker terminal to be built at Kitamat. This pipeline would go through Mt. Robson Provincial Park in British Columbia and Jasper National Park in Alberta.

CONT

Section 8.4.3.3. Transmountain Pipeline Reversal.
Seven hundred eighteen miles of 24 inch existing pipeline from Edmonton, Alberta to Vancouver, B.C. would be reversed to flow from Vancouver to Edmonton with an additional new 74 mile pipeline connection to the Puget Sound Area. From Edmonton the crude oil would be shipped to the U.S. via existing pipelines.

Section 8.4.3.4. Long Beach, California to Midland, Texas and Midwest (SOHIO).
SOHIO proposes to reverse and convert 790 miles of existing 26 and 30 inch natural gas pipeline to a crude oil pipeline and to build new pipelines of the following dimensions: 34 miles of 30 inch; 174 miles of 42 inch; 9 miles of 48 inch.

Section 8.4.3.4. Trans-Mexico Pipeline.

Section 8.4.3.6. Trans-Guatemala Pipeline.

Section 8.4.3.7. Transport by Tanker and Mid-Continent Pipelines.

a) Shipment around Cape Horn to Gulf Coast.
b) Shipment through the Panama Canal to U.S. Gulf of Mexico Coast.
c) Mid-Continent Pipeline System.

Section 8.4.3.8. Panamanian Transhipment (Northville).

Section 8.8.3.9. Summary of Port-Pipeline Systems.

Chapter 9. Consultation and Coordination.

Glossary and References.
There is not one reference to the TAPS or any document, publication, or report that originated from the TAPS experience. How can BLM write a draft EIS on a large pipeline project like the Northern Tier without making any reference to the one pipeline project that was continuously monitored by various governmental agencies during all aspects of its construction?

Map Addendum. 187 pages. Published as a seperate volume.
Alignment sheets 9-18 cover the State of Montana. There are two sets of Alignment Sheet Maps. One set delineates natural resources and impacts and the other denotes human resources and impacts. The maps are portions of USGS maps and have a scale of 1:250,000. The Northern Tier Pipeline is represented by a line approximately 1/16th of an inch wide. The pipeline therefore covers a strip about 1,302 feet wide when the NTPC has requested a 90 feet wide ROW. These maps are of a general informative nature but are of little value in determining specific locations and resources that would be impacted. It is one thing to draw a centerline on a topographical map and from that line make recommendations to minimize pipeline impacts, but quite another realization to actually see where the pipeline is scheduled to be built. Often a minor realigment of the pipeline to avoid a sensitive environmental area will be much less costly than the restoration of that disturbed habitat. In one instance on the TAPS, the shifting of that pipeline 500 feet to the east over a 21,000 foot section would have completely avoided a productive fish stream. Instead, APSC made four crossings and three channelizations of that stream which became known as Million Dollar Creek for the money that APSC spent restoring an area they could have totally avoided by a minor change in the pipeline alignment.

㊱ On page 154, under "Impacts", item 3 should be changed from Flathead Indian Reservoir to Flathead Indian Reservation.

㊲ Summary. 82 pages. Published as a separate volume.
Most of the above comments are applicable to the BLM summary statement and will not be repeated here.

The material printed on page 37 should be printed on page 36 and the material printed on page 36 should be printed on page 37.

On page 59, BLM lists the tariff rate per barrel of oil transported on the proposed Northern Tier Pipeline as $1.30 in the initial phase and $1.11 in the ultimate phase from Port Angeles to Clearbrook, Minnesota then via the Lakehead Pipeline to Chicago, Illinois (see previous comment on page 1054). On page 61, BLM states that the tariff rate on the proposed SOHIO pipeline would be $1.53 from Valdez, Alaska to Midland, Texas. These tariff rates are not comparable because BLM did not include the tanker shipping charges from Valdez, Alaska to Port Angeles, Washington in its estimate of the Northern Tier tariff. BLM also did not include the cost of moving the SOHIO transported oil from Midland, Texas to Chicago. Why did BLM not list comparable tariff rates for these two competing pipeline proposals?

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Publications on the TAPS that are directly applicable
to the proposed Northern Tier Pipeline
which are not discussed
in the BLM Draft EIS on that project

by

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presented to:

the Bureau of Land Management
at the March 8, 1979 public hearing on
the BLM Draft NTP EIS
in
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#35

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Sir,

①

I'd like to present an alternative Idea to Carry the Alaskan Crude to Central U.S.

Why not buy the Milwaukee Road and transport the oil on it. i other Words put the pipe line on wheels.

This would stop all the Seattle give away or rather keep a lot more jobs that seem to be doomed.

As this Idea spreads I think you will find that more people will be going railroad with it.

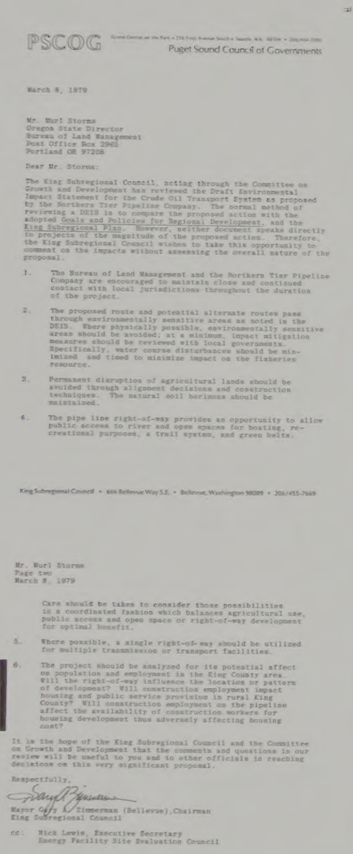
Of Course it depends on the market whether enough oil could be transported this way.

Also what are you going to do with a pipe line when the oil runs out.

The railroad will still be there as it has been for some 50 yrs. and still usable for other freight. I still think that a R.R. is the most economical as it can be maintained cheaper than most Road beds.

Yours truly
Dan J Foran

**36**



#36

PSCOG
Puget Sound Council of Governments

March 8, 1979

Mr. Murl Storms
Oregon State Director
Bureau of Land Management
Post Office Box 2965
Portland OR 97208

Dear Mr. Storms:

The King Subregional Council, acting through the Committee on Growth and Development has reviewed the Draft Environmental Impact Statement for the Crude Oil Transport System as proposed by the Northern Tier Pipeline Company. The normal method of reviewing a DEIS is to compare the proposed action with the adopted Goals and Policies for Regional Development, and the King Subregional Plan. However, neither document speaks directly to projects of the magnitude of the proposed action. Therefore, the King Subregional Council wishes to take this opportunity to comment on the impacts without assessing the overall nature of the proposal.

1. The Bureau of Land Management and the Northern Tier Pipeline Company are encouraged to maintain close and continued contact with local jurisdictions throughout the duration of the project.

2. The proposed route and potential alternate routes pass through environmentally sensitive areas as noted in the DEIS. Where physically possible, environmentally sensitive areas should be avoided; at a minimum, impact mitigation measures should be reviewed with local governments. Specifically, water course disturbances should be minimized and timed to minimize impact on the fisheries resource.

3. Permanent disruption of agricultural lands should be avoided through alignment decisions and construction techniques. The natural soil horizons should be maintained.

4. The pipe line right-of-way provides an opportunity to allow public access to river and open spaces for boating, recreational purposes, a trail system, and green belts.

Mr. Murl Storms
Page two
March 8, 1979

Care should be taken to consider those possibilities in a coordinated fashion which balances agricultural use, public access and open space or right-of-way development for optimal benefit.

5. Where possible, a single right-of-way should be utilized for multiple transmission or transport facilities.

① 6. The project should be analyzed for its potential affect on population and employment in the King County area. Will the right-of-way influence the location or pattern of development? Will construction employment impact housing and public service provision in rural King County? Will construction employment on the pipeline affect the availability of construction workers for housing development thus adversely affecting housing cost?

It is the hope of the King Subregional Council and the Committee on Growth and Development that the comments and questions in our review will be useful to you and to other officials in reaching decisions on this very significant proposal.

Respectfully,

Mayor Gary A. Zimmerman (Bellevue), Chairman
King Subregional Council

cc: Nick Lewis, Executive Secretary
Energy Facility Site Evaluation Council

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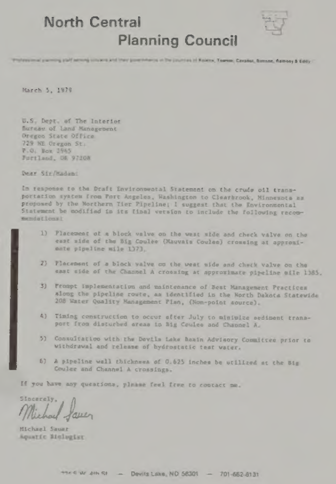
**37**



North Central
Planning Council

Professional planning staff serving citizens and their governments in the counties of Rolette, Towner, Cavalier, Benson, Ramsey & Eddy

March 5, 1979

U.S. Dept. of The Interior
Bureau of Land Management
Oregon State Office
729 NE Oregon St.
P.O. Box 2965
Portland, OR 97208

Dear Sir/Madam:

In response to the Draft Environmental Statement on the crude oil transportation system from Port Angeles, Washington to Clearbrook, Minnesota as proposed by the Northern Tier Pipeline; I suggest that the Environmental Statement be modified in its final version to include the following recommendations:

① 1) Placement of a block valve on the west side and check valve on the east side of the Big Coulee (Mauvais Coulee) crossing at approximate pipeline mile 1373.

2) Placement of a block valve on the west side and check valve on the east side of the Channel A crossing at approximate pipeline mile 1385.

3) Prompt implementation and maintenance of Best Management Practices along the pipeline route, as identified in the North Dakota Statewide 208 Water Quality Management Plan, (Non-point source).

4) Timing construction to occur after July to minimize sediment transport from disturbed areas in Big Coulee and Channel A.

5) Consultation with the Devils Lake Basin Advisory Committee prior to withdrawal and release of hydrostatic test water.

6) A pipeline wall thickness of 0.625 inches be utilized at the Big Coulee and Channel A crossings.

If you have any questions, please feel free to contact me.

Sincerely,

Michael Sauer

Michael Sauer
Aquatic Biologist

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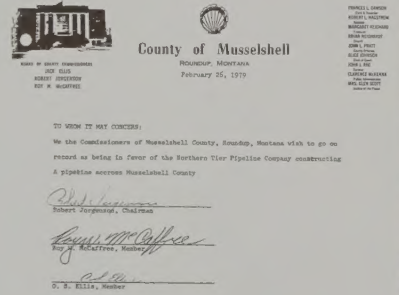
**38**



BOARD OF COUNTY COMMISSIONERS
JACK ELLIS
ROBERT JORGENSON
ROY W. McCAFFREE

County of Musselshell
ROUNDUP, MONTANA

FRANCES L. DAWSON
ROBERT L. HAGSTROM
MARGARET REICHARD
BRIAN REICHARDT
JOHN L. PRATT
ALICE JOHNSON
JOHN L. RAE
CLARENCE McKEANA
MRS. GLEN SCOTT

February 26, 1979

TO WHOM IT MAY CONCERN:

We the Commissioners of Musselshell County, Roundup, Montana wish to go on record as being in favor of the Northern Tier Pipeline Company constructing A pipeline accross Musselshell County

Robert Jorgenson, Chairman

Roy W. McCaffree

Roy W. McCaffree, Member

O. S. Ellis, Member

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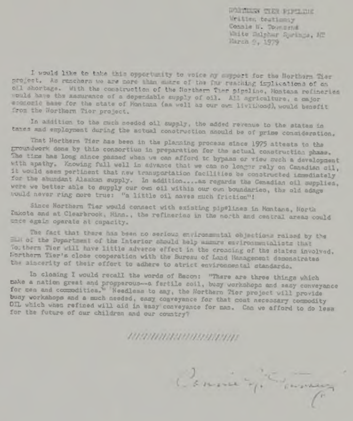
**39**



NORTHERN TIER PIPELINE
Written testimony
Connie N. Townsend
White Sulphur Springs, MT
March 9, 1979

I would like to take this opportunity to voice my support for the Northern Tier project. As ranchers we are more than aware of the far reaching implications of an oil shortage. With the construction of the Northern Tier pipeline, Montana refineries would have the assurance of a dependable supply of oil. All agriculture, a major economic base for the state of Montana (as well as our own livlihood), would benefit from the Northern Tier project.

In addition to the much needed oil supply, the added revenue to the states in taxes and employment during the actual construction should be of prime consideration.

That Northern Tier has been in the planning process since 1975 attests to the groundwork done by this consortium in preparation for the actual construction phase. The time has long since passed when we can afford to bypass or view such a development with apathy. Knowing full well in advance that we can no longer rely on Canadian oil, it would seem pertinent that new transportation facilities be constructed immediately for the abundant Alaskan supply. In addition....as regards the Canadian oil supplies, were we better able to supply our own oil within our own boundaries, the old adage would never ring more true: "a little oil saves much friction"!

Since Northern Tier would connect with existing pipelines in Montana, North Dakota and at Clearbrook, Minn., the refineries in the north and central areas could once again operate at capacity.

The fact that there has been no serious environmental objections raised by the BLM of the Department of the Interior should help assure environmentalists that Northern Tier will have little adverse effect in the crossing of the states involved. Northern Tier's close cooperation with the Bureau of Land Management demonstrates the sincerity of their effort to adhere to strict environmental standards.

In closing I would recall the words of Bacon: "There are three things which make a nation great and prosperous—a fertile soil, busy workshops and easy conveyance for men and commodities." Needless to say, the Northern Tier project will provide busy workshops and a much needed, easy conveyance for that most necessary commodity OIL which when refined will aid in easy conveyance for man. Can we afford to do less for the future of our children and our country?

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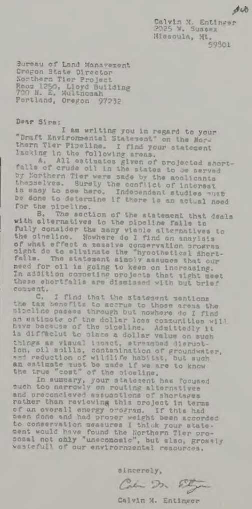
**40**



#40

Calvin M. Entinger
2025 W. Sussex
Missoula, Mt.
59801

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Sirs:

I am writing you in regard to your "Draft Environmental Statement" on the Northern Tier Pipeline. I find your statement lacking in the following areas.

① A. All estimates given of projected shortfalls of crude oil in the states to be served by Northern Tier were made by the applicants themselves. Surely the conflict of interest is easy to see here. Independent studies must be done to determine if there is an actual need for the pipeline.

② B. The section of the statement that deals with alternatives to the pipeline fails to fully consider the many viable alternatives to the pipeline. Nowhere do I find an analysis of what effect a massive conservation program might do to eliminate the "hypothetical shortfalls. The statement simply assumes that our need for oil is going to keep on increasing. In addition competing projects that might meet these shortfalls are dismissed with but brief comment.

③ C. I find that the statement mentions the tax benefits to accrue to those areas the pipeline passes through but nowhere do I find an estimate of the dollar loss communities will have because of the pipeline. Admittedly it is diffeclut to place a dollar value on such things as visual impact, streambed disruption, oil spills, contamination of groundwater, and reduction of wildlife habitat, but such an estimate must be made if we are to know the true "cost" of the pipeline.

In summary, your statement has focused much too narrowly on routing alternatives and preconcieved assumptions of shortages rather than reviewing this project in terms of an overall energy program. If this had been done and had proper weight been accorded to conservation measures I think your statement would have found the Northern Tier proposal not only "uneconomic", but also, grossly wastefull of our environmental resources.

sincerely,

Calvin M. Entinger

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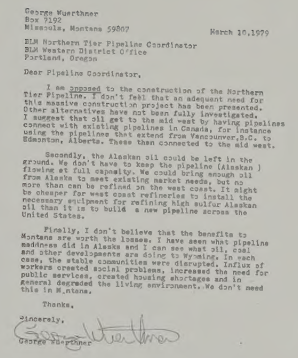
**41**



George Wuerthner
Box 7192
Missoula, Montana 59807

March 10,1979

BLM Northern Tier Pipeline Coordinator
BLM Western District Office
Portland, Oregon

Dear Pipeline Coordinator,

I am opposed to the construction of the Northern Tier Pipeline. I don't feel that an adequent need for this massive construction project has been presented. Other alternatives have not been fully investigated. I suggest that oil get to the mid west by having pipelines connect with existing pipelines in Canada, for instance using the pipelines that extend from Vancounver,B.C. to Edmonton, Alberta. These then connected to the mid west.

Secondly, the Alaskan oil could be left in the ground. We don't have to keep the pipeline (Alaskan ) flowing at full capacity. We could bring enough oil from Alaska to meet existing market needs, but no more than can be refined on the west coast. It might be cheaper for west coast refineries to install the necessary equipment for refining high sulfur Alaskan oil than it is to build a new pipeline across the United States.

Finally, I don't believe that the benefits to Montana are worth the losses. I have seen what pipeline maddness did in Alaska and I can see what oil, coal and other developments are doing to Wyoming. In each case, the stable communities were disrupted. Influx of workers created social problems, increased the need for public services, created housing shortages and in general degraded the living environment. We don't need this in Montana.

Thanks,

Sincerely,

George Wuerthner

George Wuerthner

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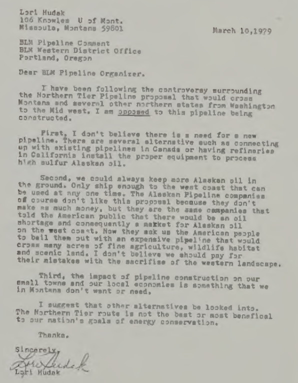
**42**



Lori Hudak
106 Knowles U of Mont.
Missoula, Montana 59801

March 10,1979

BLM Pipeline Comment
BLM Western District Office
Portland, Oregon

Dear BLM Pipeline Organizer,

I have been following the controversy surrounding the Northern Tier Pipeline proposal that would cross Montana and several other northern states from Washington to the Mid west. I am opposed to this pipeline being constructed.

First, I don't believe there is a need for a new pipeline. There are several alternative such as connecting up with existing pipelines in Canada or having refineries in California install the proper equipment to process high sulfur Alaskan oil.

Second, we could always keep more Alaskan oil in the ground. Only ship enough to the west coast that can be used at any one time. The Alaskan Pipeline companies of course don't like this proposal because they don't make as much money, but they are the same companies that told the American public that there would be an oil shortage and consequently a market for Alaskan oil on the west coast. Now they ask us the American people to bail them out with an expensive pipeline that would cross many acres of fine agriculture, wildlife habitat and scenic land. I don't believe we should pay for their mistakes with the sacrifise of the western landscape.

Third, the impact of pipeline construction on our small towns and our local economies is something that we in Montana don't want or need.

I suggest that other alternatives be looked into. The Northern Tier route is not the best or most benefical to our nation's goals of energy conservation.

Thanks,

Sincerely,

Lori Hudak

Lori Hudak

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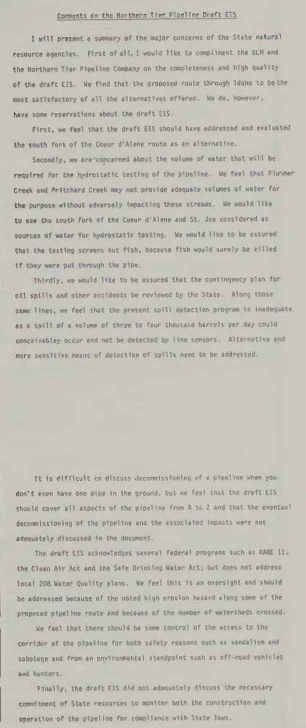

Comments on the Northern Tier Pipeline Draft EIS

I will present a summary of the major concerns of the State natural resource agencies. First of all, I would like to compliment the BLM and the Northern Tier Pipeline Company on the completeness and high quality of the draft EIS. We find that the proposed route through Idaho to be the most satisfactory of all the alternatives offered. We do, however, have some reservations about the draft EIS.

① First, we feel that the draft EIS should have addressed and evaluated the south fork of the Coeur d'Alene route as an alternative.

② Secondly, we are concerned about the volume of water that will be required for the hydrostatic testing of the pipeline. We feel that Plummer Creek and Pritchard Creek may not provide adequate volumes of water for the purpose without adversely impacting these streams. We would like to see the south fork of the Coeur d'Alene and St. Joe considered as sources of water for hydrostatic testing. We would like to be assured that the testing screens out fish, because fish would surely be killed if they were put through the pipe.

③ Thirdly, we would like to be assured that the contingency plan for oil spills and other accidents be reviewed by the State. Along those same lines, we feel that the present spill detection program is inadequate as a spill of a volume of three to four thousand barrels per day could conceivabley occur and not be detected by line sensors. Alternative and more sensitive means of detection of spills need to be addressed.

④ It is difficult to discuss decommissioning of a pipeline when you don't even have one pipe in the ground, but we feel that the draft EIS should cover all aspects of the pipeline from A to Z and that the eventual decommissioning of the pipeline and the associated impacts were not adequately discussed in the document.

⑤ The draft EIS acknowledges several federal programs such as RARE II, the Clean Air Act and the Safe Drinking Water Act; but does not address local 208 Water Quality plans. We feel this is an oversight and should be addressed because of the noted high erosion hazard along some of the proposed pipeline route and because of the number of watersheds crossed.

⑥ We feel that there should be some control of the access to the corridor of the pipeline for both safety reasons such as vandalism and sabotage and from an environmental standpoint such as off-road vehicles and hunters.

⑦ Finally, the draft EIS did not adequately discuss the necessary commitment of State resources to monitor both the construction and operation of the pipeline for compliance with State laws.

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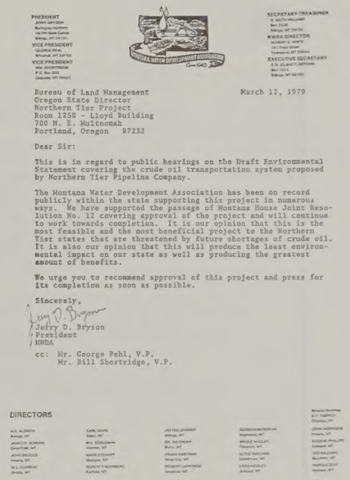

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250 - Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

March 12, 1979

Dear Sir:

This is in regard to public hearings on the Draft Environmental Statement covering the crude oil transportation system proposed by Northern Tier Pipeline Company.

The Montana Water Development Association has been on record publicly within the state supporting this project in numerous ways. We have supported the passage of Montana House Joint Resolution No. 12 covering approval of the project and will continue to work towards completion. It is our opinion that this is the most feasible and the most beneficial project to the Northern Tier states that are threatened by future shortages of crude oil. It is also our opinion that this will produce the least environmental impact on our state as well as producing the greatest amount of benefits.

We urge you to recommend approval of this project and press for its completion as soon as possible.

Sincerely,

Jerry D. Bryson

Jerry D. Bryson
President
MWDA

cc: Mr. George Pehl, V.P.
Mr. Bill Shortridge, V.P.

DIRECTORS

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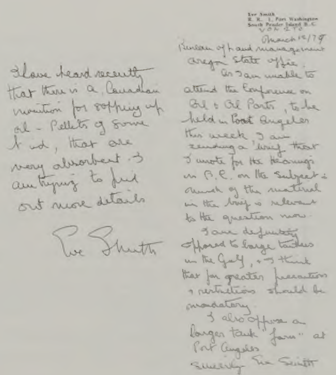

Eve Smith
R. R. 1, Port Washington
South Pender Island B.C.
V0N 2T0

March 12/79

Bureau of Land management
Oregon State office.

As I am unable to attend the Conference on Oil & Oil Ports, to be held in Port Angeles this week I am sending a 'brief' that I wrote for the hearings in B.C. on the subject & much of the material in the brief is relevant to the question now.

I am definitely opposed to large tankers in the Gulf, & I think that far greater precautions & restrictions should be mandatory.

I also oppose a larger tank "farm" at Port Angeles

Sincerely Eve Smith

I have heard recently that there is a Canadian invention for sopping up oil - Pellets of some kind, that are very absorbent. I am trying to find out more details

Eve Smith

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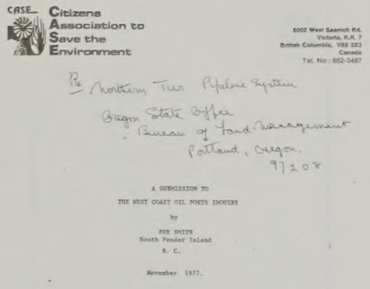


CASE
Citizens
Association to
Save the
Environment

6002 West Saanich Rd.
Victoria, R.R. 7
British Columbia, V8X 3X3
Canada
Tel. No: 652-3487

Re Northern Tier Pipeline System

Oregon State Office
Bureau of Land Management
Portland, Oregon.
97208

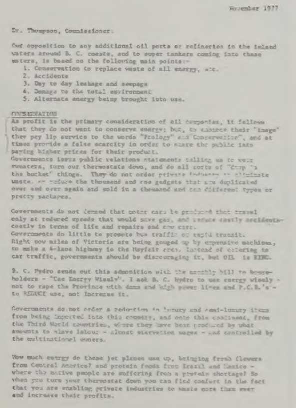
A SUBMISSION TO

THE WEST COAST OIL PORTS INQUIRY

by

EVE SMITH
South Pender Island
B. C.

November 1977.



November 1977

Dr. Thompson, Commissioner.

Our opposition to any additional oil ports or refineries in the inland waters around B. C. coasts, and to super tankers coming into these waters, is based on the following main points:-

1. Conservation to replace waste of all energy, etc.
2. Accidents
3. Day to day leakage and seepage
4. Damage to the total environment
5. Alternate energy being brought into use.

CONSERVATION

As profit is the primary consideration of oil companies, it follows that they do not want to conserve energy; but, to enhance their 'image' they pay lip service to the words "Ecology" and Conservation", and at times provide a false scarcity in order to scare the public into paying higher prices for their product.

Governments issue public relations statements telling us to wear sweaters, turn our thermostats down, and do all sorts of "drop in the bucket" things. They do not order private industry to eliminate waste, or reduce the thousand and one gadgets that are duplicated over and over again and sold in a thousand and one different types or pretty packages.

Governments do not demand that motor cars be produced that travel only at reduced speeds that would save gas, and reduce costly accidents-costly in terms of life and repairs and new cars.

Governments do little to promote bus traffic or rapid transit.

Right now miles of Victoria are being gouged up by expensive machines, to make a 4-lane highway in the Mayfair area. Instead of catering to car traffic, governments should be discouraging it, but OIL is KING.

B. C. Hydro sends out this admonition with the monthly bill to householders - "Use Energy Wisely". I ask B. C. Hydro to use energy wisely - not to rape the Province with dams and high power lines and P.C.B.'s - to REDUCE use, not increase it.

Governments do not order a reduction in luxury and semi-luxury items from being imported into this country, and onto this continent, from the Third World countries, where they have been produced by what amounts to slave labour - almost starvation wages - and controlled by the multinational owners.

How much energy do these jet planes use up, bringing fresh flowers from Central America? and protein foods from Brazil and Mexico - where the native people are suffering from a protein shortage? So when you turn your thermostat down you can find comfort in the fact that you are enabling private industries to waste more than ever and increase their profits.

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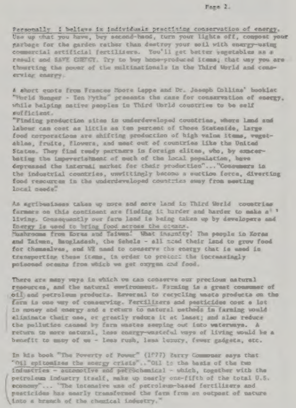


Page 2.

Personally I believe in individuals practising conservation of energy. Use up what you have, buy second-hand, turn your lights off, compost your garbage for the garden rather than destroy your soil with energy-using commercial artificial fertilisers. You'll get better vegetables as a result and SAVE ENERGY. Try to buy home-produced items; that way you are thwarting the power of the multinationals in the Third World and conserving energy.

A short quote from Frances Moore Lappe and Dr. Joseph Collins' booklet "World Hunger - Ten Myths" presents the case for conservation of energy, while helping native peoples in Third World countries to be self sufficient.

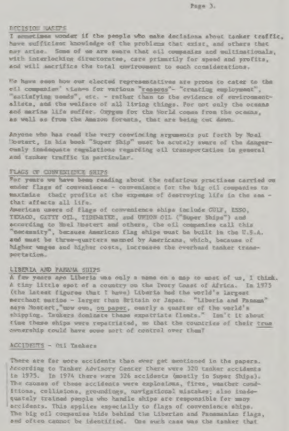
"Finding production sites in underdeveloped countries, where land and labour can cost as little as ten percent of those Stateside, large food corporations are shifting production of high value items, vegetables, fruits, flowers, and meat out of countries like the United States. They find ready partners in foreign elites, who, by exacerbating the impoverishment of much of the local population, have depressed the internal market for their production"..."Consumers in the industrial countries, unwittingly become a suction force, diverting food resources in the underdeveloped countries away from meeting local needs."

As agribusiness takes up more and more land in Third World countries farmers on this continent are finding it harder and harder to make a living. Consequently our farm land is being taken up by developers and Energy is used to bring food across the oceans.

Mushrooms from Korea and Taiwan! What insanity! The people in Korea and Taiwan, Bangladesh, the Sahels - all need their land to grow food for themselves, and WE need to conserve the energy that is used in transporting these items, in order to protect the increasingly poisoned oceans from which we get oxygen and food.

There are many ways in which we can conserve our precious natural resources, and the natural environment. Farming is a great consumer of oil and petroleum products. Reversal to recycling waste products on the farm is one way of conserving. Fertilizers and pesticides cost a lot in money and energy and a return to natural methods in farming would eliminate their use, or greatly reduce it at least; and also reduce the pollution caused by farm wastes seeping out into waterways. A return to more natural, less energy-wasteful ways of living would be a benefit to many of us - less rush, less luxury, fewer gadgets, etc.

In his book "The Poverty of Power" (1977) Barry Commoner says that "Oil epitomizes the energy crisis".."Oil is the basis of the two industries - automotive and petrochemical - which, together with the petroleum industry itself, make up nearly one-fifth of the total U.S. economy"... "The intensive use of petroleum-based fertilizers and pesticides has nearly transformed the farm from an outpost of nature into a branch of the chemical industry."



Page 3.

DECISION MAKERS

I sometimes wonder if the people who make decisions about tanker traffic, have sufficient knowledge of the problems that exist, and others that may arise. Some of us are aware that oil companies and multinationals, with interlocking directorates, care primarily for speed and profits, and will sacrifice the total environment to such considerations.

We have seen how our elected representatives are prone to cater to the oil companies' wishes for various "reasons"- "creating employment", "satisfying needs", etc. - rather than to the evidence of environmentalists, and the welfare of all living things. For not only the oceans and marine life suffer. Oxygen for the World comes from the oceans, as well as from the Amazon forests, that are being cut down.

Anyone who has read the very convincing arguments put forth by Noel Mostert, in his book "Super Ship" must be acutely aware of the dangerously inadequate regulations regarding oil transportation in general and tanker traffic in particular.

FLAGS OF CONVENIENCE SHIPS

For years we have been reading about the nefarious practises carried on under flags of convenience - convenience for the big oil companies to maximize their profits at the expense of destroying life in the sea - that affects all life.

American users of flags of convenience ships include GULF, ESSO, TEXACO, GETTY OIL, TIDEWATER, and UNION OIL ("Super Ships") and according to Noel Mostert and others, the oil companies call this "necessity", because American flag ships must be built in the U.S.A. and must be three-quarters manned by Americans, which, because of higher wages and higher costs, increases the overhead tanker transportation.

LIBERIA AND PANAMA SHIPS

A few years ago Liberia was only a name on a map to most of us, I think. A tiny little spot of a country on the Ivory Coast of Africa. In 1975 (the latest figures that I have) Liberia had the world's largest merchant marine - larger than Britain or Japan. "Liberia and Panama" says Mostert,"now own, on paper, nearly a quarter of the world's shipping. Tankers dominate these expatriate fleets." Isn't it about time these ships were repatriated, so that the countries of their true ownership could have some sort of control over them?

ACCIDENTS - Oil Tankers

There are far more accidents than ever get mentioned in the papers. According to Tanker Advisory Center there were 320 tanker accidents in 1975. In 1974 there were 326 accidents (mostly in Super Ships). The causes of these accidents were explosions, fires, weather conditions, collisions, groundings, navigational mistakes; also inadequately trained people who handle ships are responsible for many accidents. This applies especially to flags of convenience ships. The big oil companies hide behind the Liberian and Panamanian flags, and often cannot be identified. One such case was the tanker that

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Page 4.

went down off the east coast of the U.S.A. and threatened the Georgia Banks fisheries.

STEVESTON
The crude oil spill August 30, 1977 brought the tragedy of spills closer to home once again. A team from Environment Canada was quoted in the Vancouver Sun, August 30 as saying, "They had not found any evidence of environmental damage yet, but it may be too early to tell."

Whenever there is an accident, be it oil or pesticides, or as gas or P.C.B.'s, etc., the governments and private industry play it down. -"no evidence yet"... Probably the microscopic marine life, the fish, etc. were aware of some "evidence of damage". The slick spread out over a large area so perhaps the "evidence" showed up later!

REGARDING ACCIDENTS - According to C.B.C. radio news for September 29, 1977 Dr. Andrew Thompson had made a public request to the Federal Government to make public the names of foreign ships that have caused pollution in Canadian waters. It seems that the Federal Government regarded such names of ships as "secret" or "confidential".

Canadians see their beaches being washed with oil; sea birds and other sea creatures suffering and dying, the microscopic food of sea life being polluted, and yet those who commit these depradations are to be protected - or is it the Government that is being protected - from us knowing that our elected representatives are allowing flags of convenience ships in these waters? Ships improperly manned? Ships inadequately provided with safety devices?

LETTER FROM THE OFFICE OF MINISTER OF TRANSPORT, October 11,1977 - According to this letter from Pierre Deniger, Special Assistant to the Minister of Transport, the U.N. Agency Intergovernmental Maritime Consultative Organization (IMCO) policies for pollution prevention "include additional navigational equipment and collision avoidance systems, improved methods of cleaning cargo tanks, the avoidance of the use of cargo tanks for the carriage of water ballast, and inspection routines to be carried out in ports to ensure compliance with the international standards previously mentioned." Surely, we could justifiably ask, "Why haven't all these measures been brought into use years ago?"

ARROW GROUNDED IN CHEDABUCTO BAY
The Arrow, owned by Onassis, one of the world's richest people, ran ashore at Chedabucto Bay and polluted with oil sixty miles of the Nova Scotia coast.

Most of us recall the Inquiry, headed by Dr. Patrick McTaggart Cowan, that exposed the fact that the Arrow's navigation equipment was not in serviceable condition. She sailed under a Liberian Flag. The radar was not working. The echo sounder had not worked for two months. The gyro compass was out three degrees - which is a lot. The ships third officer, on duty at the time of the accident, had no license. The Captain was the only member of the crew who had navigational ability.

Page 5.

The McTaggart-Cowan Inquiry issued this statement (in Part) ..."From the records available to us the standard of operation of the world's tanker fleets, particularly those under flags of convenience is so APPALLING AND SO FAR FROM THE KIND OF SAFETY WHICH SCIENCE, ENGINEERING AND TECHNOLOGY CAN BRING TO THOSE WHO CARE that the people of the world should DEMAND IMMEDIATE ACTION." Have we demanded immediate action?

My own letters to those members of Parliament responsible are answered in an unsatisfactory way. NOT ENOUGH IS BEING DONE by any of the responsible countries. They show a devastating lack of responsibility - as has been shown in reports coming from the Law of the Seas Conferences.

NEWEST EQUIPMENT - according to Noel Mostert, it makes little difference whether or not the Flag of Convenience Ships have the newest or oldest equipment because those in charge of these ships do not know how to use the equipment or how to repair it if it breaks down.

LEGAL CONTROLS - As has been obvious for some time there is no way of getting at the owners of ships of Liberia or Panama so their policies cannot be controlled and they cannot be called to account for negligence. Millions in profits continue to pour into the coffers of the oil companies and the world continues to be polluted and we the people continue to pay the price. And, according to a news item of September 27 and 28, 1977 we are paying the price of bribes as well. Exxon is reported as having spent millions of dollars in bribes. This really is not new news, its just that it is coming out into the open more now.

ACCIDENTS are causing havoc in many places - for instance they occur frequently off the coast of South Africa. A letter dated August 22, 1977 from South African National Foundation for the Conservation of Coastal Birds tells us that there were, at that time "two tankers on the rocks off Cape Town. Raging storms and high seas have caused increasing anxiety." "Pollution threatens our coastal birds." "Pollution is a truly international problem."

THE TORREY CANYON DISASTER

This accident off the south coast of England about ten years ago received an enormous amount of publicity and roused people's interest- but just how much has been done since then to prevent such devastating occurrences? If we don't move faster towards keeping the oceans clear, by the time fossil fuels have been used up, the oceans will be polluted beyond repair. So after ten years, with accident after accident causing serious damage, the office of the Minister of Transport tells me,"International Consideration, on a priority basis, is now being given to the problems of tankers..." BUT only now, after all these years!

For many years before the Torrey Canyon disaster, environmentalists, bird watchers and nature lovers were warning of oil damage to creatures in many places in the world.

CONT

Page 6.

Pierre Deniger's letter continues.."Where cases of flagrant disregard for the provisions of Canadian legislation are reported, action to prevent such ships entering Canadian waters can be taken, subject to authorization by senior officials of Transport Canada." How flagrant is "Flagrant"? And even if the act is found to be "flagrant", prevention is subject to decisions by Senior Officials. This gives plenty of room for all companies to commit crimes undeterred. There is also room for differences of opinion, with endless litigation, and "experts" can always be found who will favour Big Business.

Besides, we must bear in mind, that day to day seepage and leaks cause enormous damage by pollution. Not enough attention is given to eliminating these two hazards.

RISKS OF OIL TRANSPORTATION (Super Spill)

I quote an excerpt from a report made to the forty-third Legislature of Washington State in 1973 by the Oceanographic Institute of Washington re large tankers. "There is considerably more difficulty manoeuvring these large tankers. Their stopping distances can be measured in miles; and the quantity of crude oil that can be spilled is staggering - ( a grounding resulting in the rupture of one main or two wing tanks could release over four million gallons of oil from a modern 120,000 d.w.t. tanker)" - and 120,000 is not one of the larger sizes!

WEST COAST DEEP WATER FACILITIES STUDY - Washington State
"An oil spill in the approaches to the San Juan Islands could disperse throughout the archipelago with long term effects."....
"Impacts of a major oil spill ... would not necessarily be limited to the disruption of the natural environment, but could result in the severe economic damage to the fisheries, shellfish, recreation industries." ... "Prime importance must be given to the national and international responsibility of the local citizenry to preserve such a resource."

Being a local citizen, I take an international view of all these destructive, polluting problems. I look out on Haro Straits and see whales go by, seals on the rocks, gulls, ducks, terns and guillemots, an occasional otter or oyster catcher, crabs and other creatures that depend on the sea life for food. Now, for various reason, resulting mainly from human activity, many of these creatures are decreasing in numbers. Seagulls, as a result of human's filthy habits of garbage and sewage disposal, are on the increase. We should be grateful to seagulls because they help us to clean up our mess. We are responsible for their unnatural increase. I mention such things because oil is not the only pollutant that contaminates our frail ocean.

As Wesley Marx points out in his book "The Frail Ocean", estuaries are the nurseries of the sea. The B. C. coast has not got so many uncontaminated estuaries left. Wherever you go you see industries that pour harmful chemicals into water ways; or log booms, which, especially if they are cedar, tend to poison the water. The logging and mining industries pollute streams and rivers with their chemicals; and all rivers end up in the sea. Lead, mercury, zinc, cadmium, asbestos, fluorides, radio-active materials from nuclear plants, pesticides, herbicides,-all wind up in the sea.

Page 7.

In the 1950's after the bomb testing, Strontium 90 was found travelling in the waters of the Pacific Ocean. DDT was found thousands of miles from where it had been used. PCB's are more recent contaminants. Oil pollution cannot be considered as an isolated cause of pollution - only one of many - but oil is an especially great hazard in inland waters.

ALTERNATE ENERGY

One of the reasons that governments and industry give for not developing solar or other types of alternate energy is the cost. While millions are being spent on researching or developing solar energy, billions are spent on nuclear energy, oil exploration and cleaning up after oil spills - and all the money in the world does not bring back to life the creatures that die, nor does it compensate for suffering. And what of the money spent on the disposal of nuclear waste?

The Energy Research and Development Administration (U.S.A.) has estimated that it will cost Eighty Billion Dollars through the year 2005 to care for nuclear weapons waste alone. That does not take into account the lack of safety in waste disposal, nor the wastes from nuclear power plants. How many buildings could be heated, cooled, lighted, etc. with 80 billion dollars? How much research into solar or tidal or geothermal energy could be done with 80 billion dollars?

INDIVIDUAL ENTERPRISE

As is often the case, in experiments, individuals are building solar heated houses. More and more independent groups are researching and building solar heated houses, as has been done before.

The Fall 1977 issue of "CO-Evolution" published in Sausalito, Calif. carries an article on Solar Water Heaters in California in 1891 to 1930. It seems that solar heat was used in Florida, New England, Arizona and elsewhere. By 1941 there were 60,000 solar heaters in Florida. The war came and copper was frozen and gas and oil and electricity took ov

We oppose the Development of Nuclear Power on the grounds of danger, hazard to health, no safe method of waste disposal , and cost. The cost of dismantling obsolete plants is astronomical.
Windmills, methane gas, possibly tidal or geothermal power and certainly solar power, could at least augment the polluting and diminishing fossil fuels.

Minimum Use of Energy
In his book "Energy and Equity" Ivan Illich says "While people have begun to accept ecological limits on maximum per capita energy use as a condition for physical survival, they do not yet think about the use of minimum feasible power as the foundation of any of various social orders that would be both modern and desirable. Yet only a ceiling on enery use can lead to social relations that are characterised by high levels of equity....Participatory democracy postulates low energy technology."

CONT

Page 8.

We wonder if there is any use in making recommendations! Too much trust has been put in technological achievements, both prevention and in clean-up. Also, the technological achievements that are available have not been used to the fullest extent possible. Far from it.

We consider that conservation of energy is in its infancy - that governments are profligate in theif waste and in the weakness of controls on industry, especially in British Columbia - B. C. Hydro for example.

The money that is being put into nuclear power and oil development could better be used in developing alternate methods. We do not want to see any more of the devastation that dams cause.

Mexican Oil - N.Y. Times, Sept.25,1977 reports on Mexican plans to supply U.S.A. with gas and oil, from what is described as "vast reserves" so we believe that this could take the pressure off northern supplies. A report in International Herald Tribune (Paris,France) says that "Mexico's gas reserves are now privately believed to exceed 60 billion barrels, roughly six times greater than Alaska's north slope." (Alan Riding Feb. 18,1977). The Mexicans are (wisely in my opinion) debating whether or not this oil "should be exploited for short term economic advantage or be kept in the ground for future generations." A report from Mexico City (A.P.) February 22, 1977 says that the oil reserves are "much larger than the 60 billion barrel figure" according to the head of the state-owned petroleum company. If the U.S.A. can get gas and oil from Mexico, it would be an overland route which is a lesser evil than tanker traffic.

I see no reason why Canada should aid and abet the U.S.A. in its wasteful destructive habits - no sane reason that is. Conservationists in the U.S.A. have been promoting the Alternate Energy idea longer than we have - also reducing waste and in using energy more wisely. A few gains have been made but not nearly enough. When oil and fossil fuels are finished, and the Scientific, Business and Government Bureaucracies have finally admitted the hazards of nuclear energy, then they will turn to solar and other forms of relatively clean and renewable energy - and by then it may be too late.

I quote Frank Fraser Darling, a pioneer ecologist, from his book, "Wilderness and Plenty" - "Our task is to become symbiotic rather than parasitic on the earth's surface and if we can fulfil it we can save civilization from being an ultimate contradiction."

Eve Smith

Page 9.

BOOK REFERENCES

THE GARBAGE BOOK A SMALL PAPER BACK PUT OUT, SURPRISINGLY, BY FEDERAL MINES AND RESOURCES, CANADA, DEPARTMENT OF ENERGY, & CONSERVATION, 580 Booth Street, Ottawa, K1A 0E4
This booklet describes how to set up a recycling program, how to compost garden and kitchen wastes, many ways of saving energy in the home and throw out less.
This is a book that Commercial Enterprises, Governments and Industries should use daily.

SUPER SPILL - Mary Kay Becker & Patricia Colwin
It is an account of the 1978 grounding of an oil tanker on Bird Rocks near Cherry Point. The appendix contains quotes from official studies of oil spill and potential hazards.

THE FRAIL OCEAN by Wesley Marx
Describes "man's ruthless exploitation of the seas and makes an eloquent plea for the preservation of the seas and their myriad inhabitants before it is too late."

SUPER SHIP - Noel Mostert's classic
About his trip in an oil tanker with details of dangers, inadequate equipment, inefficient staff, and collusion between oil companies and governments, and the oil companies' concentration on profits.

ENERGY AND EQUITY by Ivan Illich
Deals with the unequal distribution of energy, the waste and the demoralizing effect over-use and abuse of energy has on society.

THE POVERTY OF POWER - paper back by Barry Commoner 1976
Deals with crises, real and artificial "the frightening connections between pollution, economic stagnation and vanishing energy reserves." This book exposes the waste and misuse of fossil fuels, the dangers of the nuclear policy, how solar energy can be developed, how only a radical change can alter our suicidal course.

THE NATIONAL INTEREST - Politics of Northern Development by Edgar. J. Dosman - McClelland & Stewart Ltd.

100 WAYS TO SAVE ENERGY & MONEY IN THE HOME- Energy, Mines & Resources Canada

DIRECT USE OF THE SUN'S ENERGY - Farrington Daniels
"The most plentiful & cheaper energy is ours for the taking."
"If solar power was needed for war, we would have it tomorrow."

The attachment submitted with this letter was "A Submission To The West Coast Oil Ports Inquiry" by Eve Smith; Citizens Association to Save the Environment, Novemenher, 1977

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46

3-10-79

Steve Karkanen
Box 7871
Missoula, Mt.
59807

BLM
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear,sir,

In view of the following facts, some of which taken directly from the Draft Environmental Statement, I find no alternative but to remain in strict opposition to the proposed project.

1) The Minnesota Energy Agency has denied a certificate of need which is essential before construction can begin.
2) The Confederated Salish and Kootenai Tribal Council has consistantly denied an easment for a pipeline right of way across reservation lands.
3) In 1976, Port Angeles voters passed a resolution opposing the project, ordinances and land use plans that could prevent construction of an oil transshipment facility have been approved by both city and county.
4) Damages from a major oil spill will cost millions in doller terms not to mention the irreparable harm inflicted on the land or sea.
5) The project as proposed is thus far lacking any environmental restrictions such as those applied during constrution of the Alaska oil pipeline. Consequently, the impacts of the NTP will be of greater magnitude than those in Alaska. This is totally unacceptable. WILL WE NEVER LEARN ?

page 2

6) The damage inflicted by the pipeline crossing the relativly unpolluted streams and fisheries is also unacceptable.
7) The proposal would require far more electricity than is presently available. This will facilitate accelerated demand for more powerplants and transmission lines.
8) Minnesota refineries will have to pay $3 per barrel charge vs. the 40¢ refineries are currently paying for the same oil shipped from the gulf. This is an elementary lesson in economics; Why pay $3 when you can pay 40¢ ?
9) Canadian crude oil cutbacks have been delayed untill 1985, why the rush to build Northern Tier ?

10) Northern Tier is one of 8 proposed shipment routes for Alaskan crude. All the proposals need detailed impact analysis before any are approved. It appears that the NTPC is being dealt with exclusively, which understandably arrouses suspicions as to corporate influnce in government agencys such as the BLM.
11) The major benefits of the pipeline are purely economic.

Hopefully environmental concerns play a more important role in the determination of the future of the proposal than do mere economic benefits. The quality of life in the land that we live in is far more important than dollars in the pockets of a few corporate executives.
As Bearhead Swaney so eloquently stated; "money is now; Land is forever. Its all we have left"

Steve Karkanen

**47**

United States Department of the Interior
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY REFER TO: 150

MAR 13 1979

Memorandum

To: State Director, Bureau of Land Management
Portland, Oregon

From: ACTING Regional Director, Boise, Idaho

Subject: Draft Environmental Statement on Crude Oil Transportation System Proposed by Northern Tier Pipeline Co. (DES 79-3)

By memorandum dated February 13, 1979, to the Project Manager, Northern Tier Pipeline ES, BLM, we expressed our concerns about those aspects of the project affecting Bureau of Reclamation lands and operations in the Pacific Northwest and Upper Missouri Regions. Understandably, in preparing an environmental statement for a pipeline of this magnitude it is difficult to provide specifics and reflect other than general concerns. However, it remains that without more specific information we cannot with certainty identify the precise nature or the full range of impacts that will occur nor the number of Bureau projects and facilities which will be affected.

We do have some specific comments concerning the content of the draft statement for your consideration. They are as follow:

Alinement Sheets:

① There appears to be a gap in the map coverage between Alinement Sheets 12 and 13 along the shore of Canyon Ferry Reservoir.

② Sheet 13 should include a symbol showing significant terrestrial wildlife resources at the south end of Canyon Ferry Reservoir. The Montana Department of Fish and Game manages several thousand acres of Bureau lands for waterfowl upland game and big game between the community of Townsend and the Reservoir, and we are just completing subimpoundments to create 1,900 acres of marsh in this area. The corridor extends all the way between Townsend and the Reservoir and thus includes some of our area which would be quite subject to damage in the event of a spill.

Map Addendum:

③ P. 15 - The agency listings for the Bureau of Sport Fisheries and Wildlife and the Atomic Energy Commission should be replaced with current agency names.

④ P. B2 - Impacts on the Columbia River as a result of construction should be indicated as well as those from operations.

Draft ES, P. 1-59:

⑤ The statement, "The BR has study projects on the Missouri River and its major tributaries which could be affected by the proposal," should be replaced by a statement that Bureau lands might be crossed at Canyon Ferry Reservoir.

H.R. Stivers

cc: Commissioner, Attention 150

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**48**

14 MARCH 1979

DEAR SIR,

I HAVE RECENTLY BECOME AWARE OF THE PROPOSED NORTHERN TIER PIPELINE AND THE MASSIVE IMPACT IT WILL HAVE.

I AM APPALLED AT THE LACK OF REGULATIONS AND RESTRICTIONS CONCERNING THE PIPELINE. IT IS OBVIOUS THAT minimal thought has so far prevailed.

I am informed that the pipeline in Alaska, even though girdled with suffocating government regulations and restrictions, witnessed countless blunders, mistakes and plain avoidance of many requirements. In fact, the Northern Tier developers are not even going to study the lessons that were learned in Alaska as they consider this project a completely 'independent' thing.

I ask if they were to build this giant varicose vein upon our (yours and mine) landscape would they even consider the impact? Having worked around contractors and engineers for many years, I am aware of one thing; they are generally lazy and take the path of least resistance. Their main concerns are speed and ~~being~~ getting the thing done & needless to mention, cashing their paychecks.

The Northern Tier contractors are in it for one thing – money. The oil company ~~for~~ profit. Who's concerned with the land, who will look after the wildlife, the trees, the rivers & streams? Sure they will put biologists to advise on the project, but what weight will their advice carry. What does some nature lover know the engineers don't, eh?

I believe that even if the strictest precautions were taken, if sound advisors were employed, if everyone had pride in the project and realized the magic of in accomplishing a feat ~~this~~ of this magnitude; that man, being human ~~as~~ he is, would cause more harm than good. That this project ~~was~~ like the others would take its toll.

It is not possible to construct this pipeline without vast sacrifices.

Let us look at the alternatives. Let us develop the alternatives.

I bitterly oppose this project along with thousands who must yield part of their 'backyard' to this selfish moneymaking.

Sincerely

[illegible] MONTANA.

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**49**

Mr. Roger W. Burwell
District Manager, B.L.M.
Rm. 551, U.S. Court House
Spokane, WA 99201

RECEIVED
MAR 15 1979
Bureau Of Land Management
Spokane, Wa.

Dear Mr. Burwell,

① Enclosed article is part of the testimony to be submitted by Tahoma Audubon Society on the Northern Tier Pipeline Draft EIS. We request that the writers of the final E.I.S. try to find the studies quoted in this paper and to include the results (short paragraphs) in the final E.I.S. somewhere.

It is too easy to simply go ahead with plans even tho' there are serious questions remaining. The studies quoted in this paper show that there is good scientifically documented evidence of damage which occurs to marine systems when oil spills into the sea. We suggest a strong effort to look into this matter, taking full measure of the special characteristics of inland sea conditions as in Puget Sound and "river and dam" situations such as on the Columbia.

More later.

Sincerely,
Nancy Kiesning, Past President
Tahoma Audubon Society
3320 N Puget Sound Ave.
Tacoma, WA 98407

The article submitted with this letter was "Oil in the Sea: How Little We Know" by Frank Graham Jr., Audubon Magazine, November-December, 1978, pages 133-147.

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**50**

Zane and Gloria Zell
816 1st Street South
Shelby, Montana 59474
#50

Dear BLM,

We carefully read over your summary of the Draft Environmental Statement for the Northern Tier Pipeline Project. We have a few comments and question we would like you to consider.

① During the construction phase you mention that permanent alteration of topography may result in certain mountainous segments of the route. Would you please specify where this would occur in Montana?

② You state that productivity levels of salmon spawning areas in streams in the pipeline corridor could be severely impacted and that these areas could take up to 20 years to recuperate. Could you specify to what degree would salmon productivity levels be affected? Is there a certain intolerable level which definitely takes priority over the existence of the pipeline? The potential for damage here seems to be sufficient to cancel the Northern Tier project.

③ The DES declares that thousands of acres of public forest land will be denuded by the pipeline corridor. Who will bear the social costs of this effect on our watersheds and wildlife habitat?

④ The pump stations will be a continuous source of noise and their demand for electrical power may exceed available supplies. This seems to defeat the whole purpose of placing them in rural areas. Hiding inefficiency and pollution is ~~the~~ not the answer to meeting our country's energy problems.

⑤ If the BLM and oil companies are sincerely interested in a dependable, efficient ~~crude~~ crude oil transportation system - one that would provide long range employment and economic benefits with minimal environmental impacts - they should consider the use of the "bankrupt" Milwaukee railroad line. If not by rail, the crude could be moved thru pipeline on the existing railroad right-of-way if Milwaukee decides to abandon the line. It was all public give-away land anyway.

We hope to hear from you soon. Sincerely,
Zane and Gloria Zell

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**51**

March 14, 1979

State Director
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Re: Northern Tier Pipeline

Dear Sir:

I have read the Draft Environmental Statement (DES) on the Crude Oil Transportation System as proposed by the Northern Tier Pipeline Company (NTPC) and have the following comments.

Since the DES assessed a route which is no longer under consideration my comments must necessarily be limited to broad and general issues rather than site specific.

① 1. It is my understanding that NTPC is to utilize existing rights-of-way whenever possible. The Montana legislature is also under the same impression as evidenced by House Joint Resolution 17 which states that "the Northern Tier Pipeline will be primarily along existing rights-of-way. . ." However, the DES indicates that over 460 miles of the 690 mile Montana segment will be new or unshared right-of-way (these figures may vary as the proposed route is in continuous state of change). The remaining segments are to be parallel to existing railroad, pipeline or transmission line corridors. Does parallel mean parallel to and within existing railroad, pipeline or transmission line rights-of-way or perhaps parallel to existing rights-of-way with a common boundary or parallel in the sense that it is also parallel to the equator? The Final Environmental Statement should clearly identify those areas where existing rights-of-way will be utilized and the amount of new right-of-way required.

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② 2. The amount of irrigated agricultural land to be disturbed in each alternative route should be calculated. If in fact, "operation of the pipeline across potentially irrigable land (does) serve as a significant deterrent to future irrigation and drainage plans" (p. 3-102) the impacts must be assessed in greater detail. Contrary to the statement on page 3-106, in my opinion, the pipeline facilities system would seriously constrain land-use planning and zoning.

③ 3. The proposed route as well as several alternative routes pass through areas containing extensive bentonite deposits. The ability and advisability of constructing a pipeline in material that is able to expand up to fifteen times its own size should be addressed in greater detail. The ability to accomplish surface restoration in these areas is highly questionable. To compound the situation, sufficient amounts of "rock free soil and sand" for use as "padding material" may be at a premium.

④ 4. Given the information presented, the indicated route between Thompson Falls and Missoula should be re-evaluated in the following areas:

Beginning near the center of Section 17, T21N, R28W, south of the town of Thompson Falls and the Clark Fork River and proceed in an easterly direction along the south side of the Clark Fork River passing through the following sections:

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SW¼, Section 16, T21N, R29W
NE¼, Section 21, T21N, R29W
N½, Section 22, T21N, R29W
N½, Section 23, T21N, R29W
N½, Section 24, T21N, R29W
S½, Section 18, T21N, R28W
S½, Section 17, T21N, R28W

parallel existing pipeline
existing transmission corridor

S½S½, Section 16, T21N, R28W
N½, Section 22, T21N, R28W
SW¼, Section 23, T21N, R28W
NE¼, Section 26, T21N, R28W
S½, Section 25, T21N, R28W
SW¼SW¼, Section 30, T21N, R27W
NE¼, Section 31, T21N, R27W
N½, Section 32, T21N, R27W

This route would eliminate two crossings of the Clark Fork River and one crossing of the Thompson River.

5. Given the information presented, the I-90/94 corridor should be included and assessed as a viable alternative for the following reasons:

a. The I-90/94 corridor is already paid for. The costs of utilizing the I-90/94 corridor should be assessed and compared to the anticipated costs of acquiring new easement and rights-of-way.

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b. The I-90 corridor will facilitate easy access for construction, surveillence, leak detection and repair, which in turn reduces costs to the consumer.

c. The environmental impacts and disruptions may be reduced and in some cases eliminated. There are some concerns regarding the number of river crossings involved with the I-90 corridor. However, is it absolutely necessary to bury the entire pipeline? Can rivers and large streams be spanned above the surface? Obviously, the state of the art exists as is evidenced by Aleyska's spanning the Yukon River in Alaska.

d. NTPC has indicated that they desire a working right-of-way of from 90-100 feet. The Trans-Alaska pipeline is a larger diameter pipe and yet was constructed in a 54 foot right-of-way. In most areas, it is felt that the I-90/94 right-of-way can provide a majority of the necessary work space without disrupting the flow of traffic. Short term construction disruptions and detours have been tolerated by Montanans for over a decade during the construction of the interstate highway system. We have no reason to believe this project would be substantially different.

e. The added assurance of immediate leak detection and ease of access for repair is obviously quite attractive.

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⑤ 6. There are several issues surrounding the automatic leak detection system that need to be expanded and clarified. Page 6-3 of the DES states that "Minor pipeline leaks are expected to occur quite frequently throughout the life of the project." On what basis is that statement made and what exactly is a "minor pipeline leak"? It seems fair to assume that a "minor" leak is one that is not detectable by the automatic leak detection system. Since the automatic leak detection system is only capable of detecting 0.5 percent of throughput (page 1-31) a leak of 3,545 barrels per day (@ 709, 000 bpd throughput) could conceivably go undetected. As throughput was increased to 933,000 bpd an undetected leak of 4,665 bpd could occur. This hardly seems like the state of the art technology and is totally unacceptable. NTPC has stated that they intend to fly the right-of-way with a helicopter once every two weeks. If an undetected leak occurred, to the degree described above in a remote area of Montana, over a 10-day period the impact of anywhere from 35,000 to 46,000 barrels of crude oil on the soil and water resources could be disastrous.

⑥ NTPC proposes to cross the Helena valley at a location with shallow groundwater levels. If a "minor" leak were to occur in this area what environmental and economic impacts could be expected? What period of time is required to "flush" oil from the groundwater system? Is there information available relating the size of an oil spill to the size and character of a groundwater system to the rate of recovery? What methods are used to purify groundwater systems where an oil spill has occurred? To what extent will NTPC be fiscally liable for oil spills? How volatile or flammable would an oil spill on the surface be? Could residents living

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close to the pipeline be expected to pay higher insurance premiums? How will location of the pipeline, in light of potential groundwater contamination and fire hazards from oil spills, affect property values?

⑦ 7. The "directional drilling" process should be examined and addressed as an alternate method of crossing major streams and rivers.

⑧ 8. Further discussion and detail is needed to determine how pipeline construction will be accomplished during irrigation season where irrigated land and irrigation ditches and canals are to be crossed.

⑨ 9. In Montana, conservation districts are charged with administering the Streambed Preservation Act. Accordingly, permits from the districts will be required for each stream crossing. Each conservation district should have a full-time qualified person available to study the proposal and eventually oversee stream crossings that will occur in the district. In districts where personnel are not available is NTPC willing to fund a full-time, qualified person in order to help the districts fulfill their statutory obligations?

⑩ 10. An assessment must be made as to the amount of water needed to hydro test each section of the pipeline. Where will this water be appropriated and at what time of year? Where will dirty water be pumped or how will it be handled before its return to a waterway? Will water be returned to the same watercourse from which it is appropriated?

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⑪ 11. What are the anticipated geologic and hydrologic effects of the pipeline on areas affected by saline seep? What methods and procedures will be utilized in restoring these areas? What corrosive affects of saline seep on the pipeline can be expected?

⑫ 12. Section 1 of the DES is unclear as to the exact method to be used in checking pipeline welds. Page 1-40 of the draft states that all marine welds will be inspected by x-ray or gamma ray prior to application of the corrosion preventive coating. However, no further mention is made of the methods to be utilized for inspection of the remaining 1,550 miles of pipeline. Will NTPC x-ray or gamma ray each and every weld in the pipeline to insure system integrity?

⑬ 13. Figure 1.4-12 states that "Width B" of Water Course crossings will be 76"-78". This may be an accurate figure for the bottom width of the trench. However, the width at the surface will be substantially wider in most cases due to the unconsolidated nature of sands and gravels encountered in water courses. Sides of the trench will not remain vertical in this type of material but rather at the angle of repose. The impacts of this phase of construction should be expanded in further detail. Will construction work in streambeds cause siltation sufficient to foul irrigation systems?

⑭ 14. Since NTPC, as a common carrier, will have the right of eminent domain to condemn private land for right-of-way or easement can that privilege be involked to condemn public highway, transmission line, pipeline or railroad line rights-of-way for their use?

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⑮ 15. Page 1-35 of the DES briefly mentions that the quality control on the project will be accomplished by NTPC. I would like to know if NTPC is willing to fund an independent state program for quality control and field inspection similiar to that arranged in Alaska during construction of the Trans-Alaska pipeline?

16. There is widespread belief that the Northern Tier proposal will provide "an embargo-proof crude oil supply to the Northern Tier, upper Midwest and Eastern refineries. . ." (page 8.2-5 Northern Tier Pipeline Project May 1, 1978). This statement is somewhat misleading. True, the pipeline and associated fixtures (pump stations, etc.) from Port Angeles, Washington to Clearbrook, Minnesota can be considered embargo-proof. However, the product for which it is designed to transport is not embargo-proof. Table 1.4-1 on page 1-7 of the Draft indicates that 47% of the oil to be transported in the Northern Tier Pipeline system is from foreign (OPEC) sources. Page 1-4 of the Draft further implies that existing refinery facilities to be serviced by the Northern Tier Pipeline are not presently capable of processing 100% Alaskan North Slope (ANS) crude due to the high content of sulphur and that "utilization of ANS crude consequently depends partly upon the availability of suitable crudes (foreign) for mixing purposes." How will a foreign source embargo
⑯ affect the operation of the Northern Tier pipeline and the refineries it is designed to serve? What are the environmental and economic impacts of retro-fitting Northern Tier refineries to process greater amounts of north slope crude?

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⑰ 17. Table 1.3-22 on page 1-51 neatly outlines the anticipated costs (May 1978 dollars) of the project. However, it neglects to include the estimated cost of a barrel of oil or gallon of gasoline to the consumer. The DES should compare the estimated costs of the Trans-Alaska pipeline to the actual utlimate cost of that project and the subsequent cost per barrel to the consumer to the NTPC proposal and its alternatives.

⑱ What is NTPC's projected rate of return and how many years will be required to recover the initial investment?

⑲ 18. How many signed "throughput contracts" has NTPC negotiated with Northern Tier refineries?

⑳ 19. I believe that the DES did not assess the political, economic and environmental impacts of an oil spill in the Gulf of Alaska. Increased tanker traffic between Valdez, Alaska and the lower 48 states must be assessed in those terms as well as their vulnerability to sabotage and the capability of military (naval) protection in the event of war.

The United States has for many years, enjoyed an exceptional relationship with Canada. To jeopardize those relations by exposing, not only the entire western coast of Canada, but the Alaska Panhandle and Puget Sound as well, to potential oil spills seems senseless.

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The Gulf of Alaska, aside from being one of the most treacherous bodies of water in the world, also contains some of the most productive fisheries in the Northern Hemisphere. Increased tanker traffice is a bad risk and will more than likely lead to devastating oil spills.

㉑ 20. How much crude oil is produced in the Norther Tier states and what amount is exported out of the region? How much crude oil is produced in Montana and what amount is exported? To what degree would the curtailment or manipulation of exported crude oil from the state and region offset the Canadian cutbacks?

㉒ 21. Adequate assessment of national need for ANS crude oil is ignored in the DES. The public is entitled to a better accounting of this questio and evidence of a complete examination of records, such as the San Francisco House Oversight Hearings, and the recently released Department of Energy report concerning oil distribution needs.

22. In my opinion, the DES did not adequately address the alternatives to the proposed action. The problem of disposing of excess Alaskan crude oil to Northern Tier markets must be accomplished in an environmentally compatible manner and at the lowest possible cost to the consumer.

The Foothills proposal (Delta Junction - Edmonton), by itself, could eliminate up to four tanker port facilities (Port Angeles, Washington, Kitimat, B.C., Haines and Skagway, Alaska). This alternative would: a) be shorter than the Northern Tier proposal; b) would utilize the existing Alaskan Highway corridor; and c) reduce tanker traffic across the Gulf of Alaska thereby reducing the risk of a major oil spill.

**51 CONT**

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All factors which would keep increased costs of crude oil products to the consumer at a minimum.

(23) Manipulation and redirection of oil produced in the Northern Tier region must be addressed as an alternative.

Utilization and reversal of the existing Trans-Mountain pipeline and completion of the SOHIO pipeline would also appear to disperse the excess crude at a lower cost than the proposed Northern Tier system.

23. Construction of the Trans-Alaska Pipeline System (TAPS) from Prudhoe Bay to Valdez was authorized by the U.S. Congress in 1973. The TAPS was approved on the basis of National Security and National Energy Independence considerations during the height of the mid-east oil embargo. In early 1973, the U.S. House of Representatives and the U.S. Senate held hearings on the proposed TAPS. At those hearings, oil companies involved with and/or supplying the TAPS system assured Congress and the American people that if the pipeline were built there would not be a surplus of Alaska North Slope crude on the West Coast.

A mere six years later, we are being asked (told) to approve (and pay for) a multi-billion dollar pipeline that, we are told, is needed in order to gain energy independence and dispose of 500,000 bpd of "surplus" ANS crude.

(24) How can the United States gain energy independence with a refinery and subsequent pipeline system that requires 47% foreign source crude oil in order to function properly?

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(25) How and where is the present ANS crude "surplus" being disposed?

In conclusion, in my opinion, the DES was very vague and discussed impacts on the human and natural environment in a superficial manner. Primarily due to the significant lack of baseline data (soils, water, vegetation, wildlife, etc.) on which sould evaluations and recommendations are based. At times, it seemed as if there were an attempt to massage, conceal or ignore pertinent facts and conditions so as not to have an adverse affect on the proposal. The public deserves and demands better.

Thank you for the opportunity to comment.

Sincerely,

Joe Murphy
Joe Murphy
21 N. Benton
Helena, MT 59601

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**52**

615 E. Ahidby
Port Angeles, Wash. 98362
15 March 1979

B.L.M.
Portland, Oregon

RE: Hearings on N^orthern Tier Proposal

Gentlemen:

Due to a death in the immediate family, I was not able to attend the hearings here in Port Angeles. I have read the media accounts and take exception to remarks made by State Representative Andrew Nesbit, (r) of Sequim. Quote: "If you travel through my district like I do, you'd know the entire 24th district is opposed to the project".

That statement is inaccurate, lucus a non lucendo and, pardon the expression, stupidly submitted.

I, too, have travelled this district many times from one extreme to the other and find that perhaps a majority of the citizens in this district don't care one hoot one way or the other about an oil port location. There is a vocal minority group, centralized in Clallam County, particularly in the city of Port Angeles who are opposed to the oil port and to about every other potential development. This minority group would like to speak for the entire 24th legislative district as well as for the bulk of this counties citizenry. Such however, is not the case.

Substantiating facts prevail. OPERA did a complete and thourough study on the environmental and economic aspects of the proposed Northern Tier Pipeline route, during that study, it was determined that the majority of the citizens of this county did favor the oil port facility.

A straw vote, taken within the limits of this city, conducted principally by anti-oil port factions within the county court house, did show an opposition to the facility, however, this was not a county-wide vote and did not reflect the feelings of the majority of the voters.

Yours very truly,

Don McDonald

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**53**

Oral Testimony Presented at the 13 March 79 Public Hearing in Olympia on the Northern Tier Pipeline Company's Crude Oil Transportation System Draft Environmental Statement

My name is Pam Miller. I am a field biologist and have studied the Puget Sound area during the past four years.

The state of Washington is being asked to sacrifice many of its natural resources in the name of serving the national energy needs. The full extent of these resources is not given in the existing environment section of the Environmental Statement (ES). The extent of adverse impacts to these resources is also not well described. The ES states that "a description of all the resources involved is so complex that a clear picture of the potential impacts could not be drawn." As it is, a clear picture of the potential impacts still is not given in the ES.

(1) The inadequacy of information on marine resources is exemplified by the map addendum, frequently refered to in the text as a place to find more information. The maps are rarely referenced or explained through a key. The marine mammal and waterfowl concentration maps are vague and inaccurate. What is a waterfowl concentration area? Many of the important harbor seal haul out and pupping areas at river deltas along the Hood Canal are not shown.

(2) The maps are not detailed enough to be able to assess the potential impacts to the rivers and estuaries on the Hood Canal. In particular, the pipeline is proposed to run very close to the Hood Canal shoreline between the Duckabush and Hamma Hamma Rivers, but how close? It is impossible to assess the potential damage to salt marshes and other components of the estuarine systems in these areas without better maps.

(3) With either the proposed pipeline route around the Hood Canal or the cross Sound alternative, there would be serious impacts.

The state of Washington is expected to surrender the quality of its marine environment of Puget Sound for this crude oil transportation system, through high risk of devastating damage from oil spills, as well as chronic pollution. The ES states "there will be oil spills." "Small spills less than 100 gallons during oil transfer operations would be fairly frequent. It is likely they would all be contained and cleaned up." Has this been done successfully at other ports around the world?

The ES states that the risk of oil spills was derived from historical in-transit tanker spill rates. But has there ever in history been this much petroleum shipment? Or tankers this large? Or this much traffic on the Strait of Juan de Fuca and all Washington state waters? These factors must be taken into account in determination of oil spill risks. Also, the additional risks of spills from fuel barges necessary to the system, must be shown. The risks for spills between 100 gallons and 2000 barrels of oil also must be determined.

(4) The ES mentions that there would be restrictions on bilge or ballast pumping in Port Angeles Harbor. Even if ballast pumping wasn't done in the vicinity of the harbor, it could still be done in the Straits, and thus affect the water quality of the Sound. And how will these restrictions be enforced?

(5) The environmental effects of similar ports which already exist throughout the world must be described and referenced. This must include data on chronic pollution associated with ports, as well as tanker spills.

-2-

In addition to the impacts to Washington state resources, there would be serious impacts from the oil port operations at Port Angeles to nationally important and designated areas, the Dungeness and Smith Island National Wildlife Refuges and Olympic National Park.

(6) The ES states that habitat losses and disturbances on Green Point would cause species inhabiting and frequenting the site to relocate. Throughout other sections of the ES describing the pipeline route this relocation idea is also given. However, the concept of carrying capacity for habitats must be applied to these discussions. When habitat is destroyed the organisms that depended upon it cannot simply go somewhere else. The individuals and populations of many species will be harmed or destroyed.

(7) Resources which provide livlihood for thousands in the state would be sacrificed in the long run; shellfish, commercial and sport fishing and the tourist industry. These valuable resources could not be replaced in 20 years, once the economic lifespan of the pipeline is over. After 20 years will we find that the environmental costs have been worth it, with such high risks to the food resources of Puget Sound and Hood Canal? The economic costs to the state resulting from the project must be better described, including losses from degradation of marine and aquatic resources, changes in the quality of life, and effects on human health from hydrocarbon emmissions and petroleum contamination.

(8) The people of Washington will not reciéve the benefits of energy from this energy facility. In fact, it would place increased demand on the electricity supplies of the state. The ES admits that this is an unsolved problem. This is a serious issue that must be more comprehensively addressed.

(9) The need for this facility must be substantiated in the ES with more data. The ES states that solar energy would only slightly increase by 2000. This assumption is not supported and is very biased. Solar technology exists and may be implemented, if the economic obstacles were lessened. The potential effects of implementation of solar energy on the total energy needs in the Northern Tier states must be included.

For these reasons I oppose transshipment of crude oil in Washington State waters.

Pam Miller
Cascadia Research Collective
3210 Overhulse N.W.
Olympia, Washington 98502
206-866-0540

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**54**

3181 Meadowlands Drive
Sparks, Nevada 89431
March 15, 1979

U. S. Bureau of Land Management
Dick Miller, Environmental Impact Statement Coordinator
Portland, Oregon 97232

Gentlemen:

As property owners at Low Point, a geodetic survey marking located some 15 to 18 miles west of Port Angeles on the Straits of Juan de Fuca, we strongly and adamantly oppose the possible construction of an oil port at this location as proposed by Trans Mountain Pipe Line, Ltd.

With reference to the attached newspaper clipping, we sincerely and respectfully advocate and encourage the operation of a rail plan which would not cause adverse problems or restrictions.

Regardless of the relatively small population in the Low Point area, it is an established right of all individuals to protect their property. Notwithstanding our individual rights, every consideration should be given to the welfare and survival of the wildlife, fish and game that would unmercifully be jeopardized by the construction and operation of an oil port at this site.

The almighty dollar speaks loudly and carries untold precedence; however, we are hopeful that, as ordinary citizens and property owners, we still have the right and privilege of protecting and defending our property. Obviously, we have chosen this location because of its beauty, wildlife and general peaceful environment, and it is more than somewhat distressing to think that all this could be destroyed by big business with their unending power and wealth.

Please, where can we turn for understanding, consideration and assistance in our endeavors?

Sincerely,

D. E. Hermann
Donald E. Hermann

Shirley H. Hermann

Attachment

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**55**

Taku Chapter, Alaska Conservation Society
P.O. Box 1483
Juneau, Alaska 99802

21 March 1979

Mr. Albert Leonard, Manager
Northern Tier E. S. Team, BLM
700 N.E. Multnomah, Suite 1250
Portland, Oregon 97230

Dear Mr. Leonard:

(1) Attached is the testimony submitted by Dr. Oldaker at the Juneau hearing on 19 March. The sentiment expressed, strongly opposing the development of Southeastern Alaska as a major petroleum shipment lane, reflects the overwhelming feelings of our Chapter and that of most other residents of the Juneau area who are aware of this plan.

We would appreciate advance notification of further hearings or other developments on this situation.

Sincerely,

Frederick F. Wright
Frederick F. Wright
President

COMMENTS: NORTHERN TIER PROJECT
Bureau of Land Management Hearing
Juneau, Alaska, 19 March 1979

Good afternoon, Mr. Chairman, I am LAWRENCE LEE OLDAKER, Division of Education Coordinator, University of Alaska, Juneau and a director of the Taku Chapter of the Alaska Conservation Society. Thank you for permitting me the opportunity to express my comments, independent of the University but related to the interests of the Conservation Society.

Preface remarks. This public hearing and the manner in which the NORTHWEST ENERGY COMPANY proposal has been analyzed raises troublesome and fundamental issues:

1) Has there been adequate publicity on this meeting to generate full discussion?

2) Will the revised environmental impact statement address the Skagway issues?

3) Does the urgency of petroleum needs in the midwest offset environmental and economic interests of Alaska?

Basic thesis. My remarks relative to the NORTHWEST ENERGY COMPANY proposal ~~an~~ are basically cautionary. The movement of crude oil from Valdez via tanker through Southeast Alaska to Skagway for pipeline delivery to the midcontinent lacks any sustaining economic benefit to the region and state. It also poses several environmental hazards. Another routing scheme, the Trans-

-2-

Mountain, may prove to be more cost effective and less environmentally disruptive. Major points to support this thesis are as follows:

1) Tanker traffic and terminal operations in Southeast Alaska would threaten major "renewable" resource industries, fisheries and tourism. The salmon catch from the Icy Strait - Chatham Strait - Lynn Canal area is valued at $13,146,000; an additional $561,000 is realized in King and tanner crab sales. The economic damage of potential oil spills in this fertile fishery area is a threatening spectre. Although 430,000 tourists spent $175,000,000 in Alaska-at-large during the preceding year, the Panhandle area witnessed a large share of financial benefit which was attributed to visitors seeking wilderness-oriented pleasures. (Please see enclosures for details.)

2) Large-scale tanker movement in Southeast Alaska would conflict with gill netters, purse seiners, trollers, tour boats, and pleasure crafts.

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3) The physical and climate conditions offer further transportation problems within the inside waters. Narrow, rocky channels; widely varying tides and stream currents; and high winds add to the problem. Taku winds of 30-70 knots per hour for periods of two to three weeks are common. Oil spill recovery measures appear to be ineffective in waters with strong current and wave action above two to three feet.

4) Skagway, the focal point of the proposed NORTHERN TIER route, would receive a brief economic boost during the terminal development phase but could not look to any degree of monetary gain in post-construction years. Problems in building a pipeline over the White Pass are legion.

Table ~~2~~7-1. Average annual value to fishermen of commercial fisheries in the Icy Strait/Chatham Strait/Lynn Canal area. See Tables 2-3 to 2-6 for additional detail.

| | Icy Strait | Chatham Strait | Lynn Canal | Total |
|---|---|---|---|---|
| Salmon | $6,833,000 | $2,830,000 | $3,483,000 | $13,146,000 |
| Herring | | | | |
| Halibut | | | | |
| Sablefish | | | | |
| King crab | 112,000 | 70,000 | 20,000 | 202,000 |
| Tanner crab | 276,000 | 43,000 | 40,000 | 359,000 |
| Dungeness crab | | | | |
| Total | 7,221,000.— | 3,943,000 — | 3,543,000 | 13,707,000 |

Data from DRAFT ADFG report
on Potential Impacts of oil transport
upon SE Alaska

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Tourism Statistics from
Alaska Dept of Commerce & Economic Development,
Division of Tourism, Juneau

-3-

Summary. Accepting the perceived need to place Alaskan oil in the midwest as a real concern, we believe any of the other alternatives would be more beneficial to the nation, state, and region. The potential for long- and short-term hazards to the Southeast Alaska panhandle should dissuade the selection of the Skagway tanker-pipeline route as the means to send oil to the nation's heartland. Thank you again for permitting the expression of this view.

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56

March 20, 1979

Bureau of Land Management
Northern Tier Project

It seems to me that you should consider the proposed Northern Tier Crude Oil Transportation System in all of its ecological impact.

For instance, it is wrong to make the excuse that the surplus of high sulfur crude oil from Alaska requires another pipeline, for that would be the perpetuation of an error which was damaging environmentally and expensive economically. This money could be spent to encourage the production of ethanol from biomass for this would provide jobs and an alternative for crude oil.

The demand for jobs should be more carefully considered. It is wrong to permit immigration if there is unemployment as each nation is responsible to use birth control to adjust its need for babies to resources and jobs available. The crowded overpopulations of the world will continue to invade and occupy the U.S.A., ignorantly dumping their children on the welfare system of the U.S.A., until a firm stand is taken on the truth that the pursuit of employment does not constitute a vested right to ruin the environment and wildlife habitat. It has been proven on the other hand, that more jobs are generated with protection of the environment. The pipeline for the northern tier is an unnecessary boondoggle, as was the Alaskan pipeline; for there are ever-increasing demands for alternatives to the automobile which kills, pollutes, and bankrupts and is called mankind's greatest blight.

The plea for an "All-American" pipeline is specious as the threat of tanker spills in the Straits would mean an American-Canadian catastrophe ecologically. There is a question as to just what is meant ~~by~~ on page 38 of the "Summary", for there is the statement that the basic purpose of the pipeline is to transport Alaskan and foreign crude oil? Please, gasoline rationing is better

Rt1- 171 Pathfinder Lane, Port Ludlow, Washington. 98365 E. ZAHN

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United States Department of the Interior
BUREAU OF LAND MANAGEMENT
OREGON STATE OFFICE
P.O. Box 2965 (729 N.E. Oregon Street)
Portland, Oregon 97208

IN REPLY REFER TO:
1792 (911.2)

PUBLIC HEARINGS REGISTRATION FORM

For Public Hearings on the Draft Environmental Statement on the Crude Oil Transportation System as proposed by the Northern Tier Pipeline Company

To: Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

(Please print)

From:
Name E. ZAHN
Street Address Rt. 1- 171 Pathfinder Lane
City and State PORT LUDLOW, WASHINGTON
Zip Code 98365

I wish to appear at the following public hearing and express my views:
We use too much gasoline. We would not need the pipeline if gasoline was rationed.

I intend to submit written documentation: Yes X No ____

Signature E. Zahn

Verbal testimony may be limited to 10 minutes; written testimony is acceptable until April 2, 1979

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57

March 19, 1979

Bureau of Land Management
729 N.E. Oregon St.
Portland, Oregon 97208

Gentlemen:

Deficient in scope, was the prime message the Daily News attempted to convey through their reporting of the Bureau's hearing at Port Angeles March 16, 1979 regards the oil port and the pipeline planning of Northern Tier.

How any project the size and scope and magnitude of this pipe line could be otherwise is beyond me. The ramifications of the thing are many and for anyone or any group of experts to be able to identify all aspects would be to make them just a little better than perfect. To my knowledge no human has yet attained perfection.

Each day I begin my own work deficient in something. Through resourcefulness and adaptability I usually end with some satisfactory accomplishment. I am sure Northern Tier would attempt to do a good job. They have to.

The line is needed, that is not the question. Just how quickly it can be finished seems to be more pertinent to the welfare of this nation.

Sincerely,

Henry Bechtold
Henry Bechtold

H. BECHTOLD
P. O. BOX 207
SEKIU, WA 98381

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58

NORTH DAKOTA FOREST SERVICE

DEPUTY STATE FORESTER 701-228-2277 EXTENSION 35
STAFF AND FIELD SERVICES FORESTER EXTENSION 51
STAFF AND NURSERIES FORESTER EXTENSION 34
BOTTINEAU, NORTH DAKOTA 58318

March 16, 1979

RECEIVED
MAR 19 1979 BLM
NSON, N. D.
ACTION ____ FILE ____

Mr. Charles E. Steele
Bureau of Land Management
P.O. Box 1229
Dickinson, ND 58601

Dear Chuck:

I have reviewed the draft environmental statement for the Northern Tier Pipeline Company and the effect it may have on the North Dakota Forest Service. I hope it is not too late for comments.

① The pipeline as drawn will be going within a mile of the State tree seedling nursery at Towner, North Dakota. We, of course, do not wish to see the pipeline any closer. The Nursery and recreation area are located in Section 31, Township 157, Range 75 just north of the proposed pipeline route. The U.S. Forest Service also has land in Section 31, 32, and 33 of the same township in McHenry County. If the proposed pipeline should be moved any further north, it would cross the Nursery and interfere with tree production. It would also cross the State recreation area near the Nursery.

The Nursery and recreation area must be avoided in construction of the pipeline.

Sincerely,

Walter Pasiczynk
Walter Pasicznyk
Deputy State Forester

ma

c.c. Dr. Robert E. Johnson

Equal Opportunity Employer

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59

NORTH DAKOTA GAME AND FISH DEPARTMENT
PHONE - 224-2180
BISMARCK, N.DAK. 58505

March 20, 1979

Bureau of Land Management
729 N.E. Oregon Street
Portland, Oregon 97208

Gentlemen:

Enclosed are our comments on the Northern Tier Pipeline Environmental Impact Statement. Overall, we were pleased with the comprehensiveness of the document; we felt that for the most part, it presented the issues completely and fairly.

We appreciate the opportunity to comment.

Sincerely,

Russell W. Stuart
Russell W. Stuart
Commissioner

RWS:ls
enclosure (1)

Comments of N.D. Game and Fish Department
on the EIS Regarding the Proposed
Northern Tier Pipeline

1. We note from the alignment sheets in the Map Addendum that the proposed pipeline is parallel to other transportation systems in many places. We endorse this "utility corridor" concept as the least environmentally damaging in many cases.

① 2. We note on p. 3-74 the assertion that "the state of North Dakota has classified the Little Muddy River Class II." This is somewhat misleading. The State Health Department has rated the stream as II, based on its suitability for direct use by humans. The Game and Fish Department, however, has published another ranking of permanent streams in North Dakota, based upon the fishery present and aquatic habitat considerations. Under this system we have ranked the Little Muddy River as 1, highest value, due to the presence of high forage, fish production and other factors. Other streams crossed by this proposal in or adjacent to North Dakota which we have ranked are the Missouri River (rank 1), the White Earth River (rank 1), the Des Lacs River (rank 2), the Souris River (rank 1), Egg Creek (rank 1), the second Souris crossing (rank 1), Big Coulee (rank 1), the North Branch of the Turtle River (rank 4), the Turtle mainstem (rank 2), and the Red River (rank 1). The fact that impacts to these streams from the proposed action are considered in this EIS points up the need for extreme care to be taken to minimize adverse environmental effects. There are also numerous intermittent streams and wetlands in the path of the proposal. Some losses would be certain to occur and adequate mitigation should be provided for in the work plan.

② 3. We are disturbed to note (p. 3-84) that an oil spill of 4,640 barrels per day could go undetected by the remote sensing system, thus depending for detection upon the biweekly overflights required by federal regulation. The potential is thus there for a spill of upwards of 65,000 barrels of oil to occur before detection. Given that this proposal would traverse North Dakota's prairie pothole country, such an occurrence could be catastrophic. Is this the best level of detection we can hope for? We will be quite interested in the contents of the spill contingency plan (p. 1-55) when it is developed, how it will apply to North Dakota, and what unavoidable impacts will result from spills.

4. It is perhaps understandable that specific construction start-up times, soil segregation and seeding techniques, mitigation for lost wildlife habitats such as woodlands and wetlands, and specific measures to minimize sedimentation at stream crossings, cannot be detailed at this time. ③ We hope we will have the opportunity to contribute to the resolution of these issues at some later date, as during the permitting process. We would like to make the following general comments, however:

   ④ a. There seems to be no provision for segregating topsoil other than in irrigated or prime farmland areas (p. 1-44). We strongly recommend that such "double-ditching" be done over the whole route, at least in North Dakota. Seeding success after backfilling could depend upon this.

   ③ b. Losses of woodlands, especially riparian habitats at stream crossings, for the life of the project is a serious matter for a state that is very near to having fewer trees than any other state in the Union. Our usual recommendation is replacement on a 2 for 1 basis, if not on site, then somewhere close by.

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③ c. We recommend avoidance of wetlands wherever possible. If it is necessary to disturb a wetland, we strongly recommend adequate mitigation, the nature of which would be jointly agreed upon.

d. Seeding mixtures, planting times, topsoil respreading, grading, and maintenance techniques will all have a bearing on the success of the revegetation effort. Again, we hope to be able to present our views on these issues when it becomes appropriate to do so.

e. Impacts upon duck production and other aspects of wetland habitats may be able to be reduced if any necessary disturbance is carefully timed. Similarly, stream crossing impacts can be minimized at low flow times. We are prepared to supply technical assistance when needed in these areas also.

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60

north dakota parks and recreation

NORTH DAKOTA PARKS AND RECREATION DEPARTMENT
Fort Lincoln State Park
Route 2, Box 139
Mandan, North Dakota 58554
Phone (701) 663-9571

March 23, 1979

Bureau of Land Management
Oregon State Office
129 NE Oregon Street
Portland, OR 97208

Dear Sirs:

This Department wishes to make the following comments concerning the Draft Environmental Statement of the Crude Oil Transportation System from Port Angeles, Washington to Clearbrook, Minnesota, as proposed by the Northern Tier Pipeline.

① It is understood that this is a draft environmental statement and that the route proposed therein is not an exact route. However, with the level of detail provided to us in this draft, it appears that the pipeline could have some impact on areas that we have interests in. The communities of Berthold, Knox, Leeds, Lakota, and Petersburg all have outdoor recreation facilities within or adjacent to their boundaries which were partially funded with money from the Land and Water Conservation Fund Act of 1964. The 6F provision of this Act states that projects funded with this money will remain in outdoor recreation use in perpetuity. A pipeline crossing of these areas would not be permissible without replacement of the land affected by such a crossing.

This Department is also responsible for the State Nature Preserve System. A potential inclusion to this system lies within the pipeline corridor. It is called Pleasant Lake Woods and is located in Sections 8 and 9, Township 155 N., Range 71 W. Although there are no regulations making it mandatory to avoid such an area, we would hope to work closely with the Northern Tier Pipeline Company to determine if this area can be avoided.

Also, Turtle River State Park, near Arvilla, is located within the corridor boundaries. State parks are held to be exclusion areas for utility crossings and as such, no crossing through the park would be permitted.

② Some of the more general statements concerning recreation in the draft environmental statement are incorrect and should be pointed out. The errors are contained in Chapter 3. On page 117, it is stated that "No areas of critical importance to recreation would be crossed by the 2-mile wide study corridor." Since the corridor crosses the prairie pothole region, which is a major area of duck production, it does have implications and impacts on an area which is critically important to some types of recreation, especially waterfowl hunting. On page 118, it is stated that since national wildlife refuges do not allow public use, they are not important to recreational hunting or nature-related activities. The fact is that some public use is permitted on these refuges and they are critically important to a variety of recreational activities.

③ Also, on page 118, the Devils Lake Recreation Area is identified as being southwest of Minot. This area is actually located east of Minot. It is likely that the Devils Lake Recreation Area will receive additional use during the construction phase of the project. My question at this point is: Was only the location of the Devils Lake Recreation Area incorrectly identified, or is there a recreation area southwest of Minot which will also be impacted?

In Chapter 4, page 8, it is stated that no mitigating measures concerning recreational resources have been proposed by the applicant. We feel that it is Northern Tier Pipeline Company's responsibility to work closely with all agencies concerned with outdoor recreation resources and to provide mitigating measures in those cases where it is determined to be necessary.

If you have any questions concerning any of the above comments, please contact me at this office.

Sincerely,

Terry Vibeto

Terry Vibeto
Planner

TV/rkb

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61

NORTH DAKOTA STATE PLANNING DIVISION
STATE CAPITOL · NINTH FLOOR · BISMARCK, NORTH DAKOTA 58505
701-224-2818

March 23, 1979

STATE INTERGOVERNMENTAL CLEARINGHOUSE SUPPLEMENTARY "LETTER OF COMMENT" ON PROJECT REVIEW IN CONFORMANCE WITH OMB CIRCULAR NO. A-95

To: Bureau of Land Management, Oregon State Office

STATE APPLICATION IDENTIFIER: 7901119034

Mr. Frank Hamerski, Acting Project Manager
U.S. Dept. of Interior
Bureau of Land Management - Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Hamerski:

Subject: Draft Environmental Impact Statement for the Crude Oil Transportation System.

This Draft EIS was recieved in our office January 11, 1979.

The above referenced draft EIS has been reviewed through the North Dakota State Intergovernmental Clearinghouse in compliance with Office of Management and Budget Circular No. A-95 and/or North Dakota Executive Order No. 48. Previous comments were forwarded to you with a "Letter of Comment" dated January 15, 1979 and "Supplementary Letter of Comments" dated February 22 and 26, 1979, March 5, 1979. Since then, additional comments have been received from: North Central Planning Council.

This letter and the attached comments constitute the further comment of the State Intergovernmental Clearinghouse. To further document your compliance with Office of Management and Budget Circular No. A-95, this letter, the attached comments and your response to those comments should be made a part of your proposal.

Please use the above SAI number for reference to the above project with this office. Your continued cooperation in the review process is much appreciated.

Sincerely yours,

Bonnie A. Banks

Mrs. Leonard E. Banks
Associate Planner

BAB/gd
Attachment

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62

OLYMPIC PENINSULA AUDUBON SOCIETY
P.O. Box 502 - Sequim, Wa. 98382

March 22, 1979

Statement presented by Harvey Kailin, Chairman, Conservation Committee, Olympic Peninsula Audubon Society at the BLM Public Hearing In Port Angeles, Washington, March 15, 1979

My name is Harvey Kailin, representing the Olympic Peninsula Audubon Society, an organization of some 300 adult members. Because the interest of our organization is in the natural environment, we are concerned about developments which could have serious environmental consequences. Our comments will be, for the most part, general - various specifics have been or will be commented on by others, including No Oilport, Inc., whose position on the Northern Tier project we support and whose questions about it we also wish answered. A number of our members have been working with the Citizens Task Force to provide expertise on the flora and fauna of the area, and on various environmental factors involved in the Northern Tier project.

In reviewing the BLM's DES, we find it has significant limitations. For example:

1. Congress mandated an earlier completion date for the BLM study than was consistent with doing an adequate job. BLM officials as well as others previously have pointed this out. The earlier testimony here confirms that conclusion.

2. Another limitation, not the fault of BLM, is that Northern Tier's changing specifications have made it difficult to know just what to evaluate. For example, in January Northern Tier designated a new primary route through Montana. In this State, at this late date, a major change in pipeline route apparently is imminent, according to Northern Tier officials. Will the pipeline go around Hood Canal and then across the State, or will it proceed by submerged pipeline through the Strait of Juan de Fuca, across Whidby Island, and then eastward? Different routes of course involve different environmental impacts.

① And just what size operation is involved in this project? The bulk of the DES statistics deal with a 709,000 bpd or a 933,000 bpd operation. But late in the DES we learn that expansion of the project to a 3 berth, 1.23 million bpd operation is possible. Shouldn't an operation of at least that size be used as the basis for determining impacts? Senator Jackson talks about the need to step up Alaska production to 2 million bpd - what effect would that have on Northern Tier's operation? And Northern Tier talks about access to 50 refineries with a capacity of 3.6 million bpd. Clearly, it would not be responsible to base conclusions on an initial size of operation, with so many open ended possibilities on the horizon.

② 3. Another major limitation of the BLM study is a reflection of the limitation in its scope. An oil superport doesn't exist in isolation - it is a magnet for other developments, particularly those in the petrochemical field. For example, a business consortium recently announced plans for building a large refinery to be supplied from oil reaching this area through the superport. Once a large crude oil source exists, it is almost a certainty that refineries and petrochemical plants which use refinery products as their feedstock will be sited close to the superport. Once a port is sited, the pressure to get approval for such plants will prove to be inexorable. This prospect was summarized in a study made a few years ago by the Puget Sound Economic Development Council in anticipation that such an oilport would be sited here. The study study pointed out that the development of related petrochemical industries is a logical accompaniment to an oilport. Not only would the port be the source of the industry's feedstock, but it would be an economical location from which the industry's finished products could be transported to the entire west coast area. What would be the impacts of such developments? Aren't they likely to be greater than those of the oilport and pipeline? Isn't the consideration of their impacts required for a meaningful impact statement?

③ What are some of the important places or locations in this general area which could be impacted by the Northern Tier project. The borders of the Olympic National Park of course are very close to the port, tank farm, pipeline, and to future industrial developments based on the oil supply this project would make available. The Park recently has been designated by UNESCO as one of a limited number of biosphere reserve areas. The Park possesses an unusually diverse collection of plants and animals. It has the potential to serve as the base for reconstituting genetically depleted areas. It is highly questionable whether the model used for determining deterioration of air quality, as noted by the Park Superintendent, permits an adequate evaluation of the project's impact on the Park. This limitation, plus the others I referred to earlier, raise serious questions about what the consequences will be for the Park.

④ The limitation of the DES also are pertinent to questions about water quality, which would be affected by oil spills, chronic or otherwise, resulting from a large scale movement of tankers, tanker unloading operations, the barge traffic necessary to provide bunker fuel for the tankers, the operation of the pipeline, and the operations of petrochemical industries which can be expected to be sited near the oilport. How many rivers and watersheds crossed by the pipeline will be impacted? What will be the effect on Dungeness Spit and Harbor, the largest Federal waterfowl sanctuary in the State.

⑤ With regard to Dungeness Spit there is an additional problem, as its continued existence depends on its being fed by the easterly flow along the Strait carrying materials from the bluffs which border the Strait. Interference with such movement, by pipelines from the port, with associated bulkheads or other devices needed to protect the pipelines, could interfere with the water flow and prevent the buildup to the Spit necessary for its continued existence. Experience with Ediz Hook, where the natural buildup of that spit was interferred with and where costly maintenance has been necessary to preserve the harbor are a warning of what could happen to Dungeness Spit.

⑥ Our membership includes a number of individuals with expertise in the flora and fauna of the area. They have identified a number of rare and endangered plants on the Olympic Peninsula, including:

> Calypso bulbosa, Eriophyllum linatum var. achilleoides, Erythronium oregonum, Hemitomes congestum, Lipidium virginicum var. menziesii, Scirpus cyperinus, Sedum lanceolatum var. rupicolum, Botrychium virginianum, Chrysolepsis chrysophylla, Euarophyton austiniae, Plantago macrocarpa, Bromus vulgaris var. eximus, and three Clarkia amoenas (var. pacifica, var. caurina, and var. quadrivulnera), Pucinellia pauciflora var. pauciflora, Sheperdia canadensis, Abronia umbellata var. acutalata (found on Ediz Hook), Bromus sitchensis var. sitchensis, and Juncus gerardii.

⑦ As to bird life, peregrine falcons have been sighted at Dungeness Bay. There are roosting trees for them near Jamestown Beach. Birds of concern from the Audubon 'blue list' (birds which are threatened) and which are present on the Olympic Peninsula include:

> The Redneck grebe, the Western Grebe (both highly susceptible to oil damage since they sleep on the water), the Canvas Back, Sharp shin Hawk, Cooper's Hawk, Marsh Hawk, Osprey (a summer resident with a couple of nest sites known on the northern part of the Olympic Peninsula), the American Kestral, the Pigeon Hawk, the Common Tern which migrate through Dungeness Bay, the Short eared Owl, the Hairy Woodpecker, the very rare Western Bluebird, the Yellow Warbler, and the Warbling vireo.

⑧ We feel that the DES doesn't provide an adequate basis for weighing the environmental costs to the public, including costs to fishery resources, to the recreational industry potential of the area, to the Park, to the rare and endangered plant and bird species, etc. or for comparing them with possible benefits of the project. In other words, a comprehensive cost-benefit analysis, based on a thorough environmental study, is needed.

⑨ The DES also has an inadequate treatment of need for the project and of alternative ways of meeting need. It is unfortunate that the Department of Energy study relating to those matters was delayed and its findings not adequately reflected in the DES. It is important to get an objective measure of need, and of the extent to which alternatives such as redirection of indigenous supply in the northern tier states, increase of trade-off arrangements, improvements in existing oil transportation facilities, new oil finds, etc. can meet the need.

In summary, we do not feel that an environmental statement can serve the needs for which it is designed if:

1. It doesn't provide an adequate basis for evaluating environmental impacts.
2. It doesn't provide a comprehensive cost-benefit analysis.
3. It doesn't thoroughly explore need and alternatives for meeting that need.

One final observation. The Audubon Society believes that there is an important principle to be followed in connection with developments such as the proposed one. That is that developments such as the Northern Tier one should be located in already impacted areas rather than in relatively unspoiled ones such as represented by this area. We find no compelling case, nor has the DES developed one, for violating this principle.

Submitted by

Harvey Kailin

Harvey Kailin, Chairman
Conservation Committee

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63

624 Speedway
East Missoula, Montana
59801
March 18, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Sirs:

I oppose the Northern Tier Project for the following reasons:

① 1. A. Draft Environmental Statement reviewed only ways of moving the Alaska crude oil to Northern border and Midland States and neglected other potential solutions to the overall crude oil supply problem in the central U. S.

② B. Failed to consider the modernizing of west coast oil refineries not geared to refine Alaskan crude oil.

③ 2. Northern Tier Pipeline Company has failed to mention in case of an oil spill who would be responsible for cleanup and restoration costs.

3. Fear that the Northern Tier Pipeline, if approved, would create a new right-of-way corridor that in time likely would attract additional energy transmission facilities.

Northern Tier Pipeline would not solve the energy problem, but just prolong it and create many new problems for Montana and its citizens.

Respectfully,

Robert Barker

Robert Barker
624 Speedway
East Missoula,
Montana 59801

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64

Six Mile Road
Huson, Montana 59846
March 21, 1979

BLM - Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Gentlemen:

After having attended informational meetings chaired by employees of the Northern Tier Pipeline Company, after having attended several more meetings sponsored by concerned local citizens, and after having read everything I could find on the proposed Northern Tier Pipeline, I feel that I must express my opposition to the proposed line.

It would take hours of my and your time to spell out in great detail each of my objections. I do wish, however, to list a number of my objections:

1. The D.E.S. on the proposed Northern Tier Pipeline states that a "surplus" of Alaskan crude exists on the West Coast. This "surplus" is presently being shipped by way of the Panama Canal to midwestern refineries.

2. Other means of shipping this "surplus," both existing and proposed, would prove to be more efficient, less expensive, and have less adverse environmental impact.

3. Changing present marketing patterns would alleviate the shortage in the Mid-West.

4. Why build Northern Tier Pipeline, whose daily capacity is projected to be over 900,000 barrels per day when the projected shortage in the Mid West by the year 2000 is expected to be only 400,000 barrels per day?

5. The electric power requirements for pumping the oil through the proposed line would exceed twice the capacity of Hungry Horse Dam. These requirements would place an additional strain on an already overworked Northwest power system.

6. The electronic sensoring equipment proposed by N.T.P.C. would allow an undetected leakage of 1,340 barrels per day.

7. Construction of the proposed N.T.P.C. would set a corridor precedent along the entire route. Montana does not need any additional power corridors to mar its Big Sky.

① 8. The Draft Environmental Statement completely fails to address the issue of the effects construction and haulage would have upon roads and highways along the route. No requirements have been made to prevent damage to these roads nor to restore them to their present state. Just who paid for damages to the Alaskan highways?

② 9. Sections of the route parallel the Nine-Mile fault. Their geologists "assure" us that this fault is inactive. Will the N.T.P.C. also assure us that they will be financially responsible for all damages to private property caused by spillages if faulting ruptures the line?

10. The proposed pipeline would have an adverse effect on the rural, scenic lifestyle chosen by those along its route. I chose a homesite for the same values that the proposed pipeline and power corridor would destroy.

③ 11. The proposed pipeline is one of many misdirected, piecemeal attempts to solve or alleviate a national energy crisis. What we really need is a clearcut national policy of conservation, and not another means of expediting waste.

④ 12. The right-of-way requirements exceed that of the Alaskan Pipeline, which is larger in diameter than the proposed N.T.P. In addition, the Mineral Leasing Act of 1920 stipulates that the right-of-way for pipelines through federal lands should not exceed 54'.

⑤ 13. The B.L.M. Draft Environmental Statement fails to address the potential impact the proposed pipeline might have upon perched or shallow water tables which are important supplies for livestock and irrigation. Will N.T.P.C. pay for any financial loss incurred if disruption of such supplies occur?

14. The proposed surveillance program of one N.T.P.C. employee acting as an environmental inspector per construction spread is obviously inadequate.

⑥ 15. The social impact assessment within the D.E.S. does not comply with the ground rules for such assessment.

⑦ 16. The proposed pipeline passes through many homesites and would result in an unfair devaluation of residential property. Would the N.T.P.C. compensate homeowners for such loss?

⑧ 17. The burden imposed by construction employees dependents upon local school systems would not be offset by any additional tax revenue upon the proposed line. Overcrowding presently exists in the Missoula, Frenchtown, and Alberton systems.

As a homeowner in the area through which the proposed pipeline would pass, I am naturally concerned for my own quality of life. However, I am not just saying, "find a different route." I am saying that the Northern Tier proposal should be carefully examined in terms of need and efficiency, and that its horrendous costs (amount of energy used in its construction, environmental and social impacts) should be carefully considered before we allow an "energy crisis" to frighten us into unwise decisions.

Sincerely,

William Z. MacDonald

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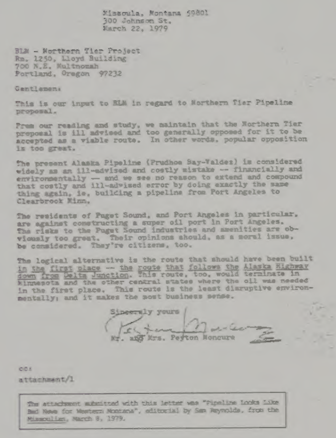

Missoula, Montana 59801
300 Johnson St.
March 22, 1979

BLM - Northern Tier Project
Rm. 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Gentlemen:

This is our input to BLM in regard to Northern Tier Pipeline proposal.

From our reading and study, we maintain that the Northern Tier proposal is ill advised and too generally opposed for it to be accepted as a viable route. In other words, popular opposition is too great.

The present Alaska Pipeline (Prudhoe Bay-Valdez) is considered widely as an ill-advised and costly mistake -- financially and environmentally — and we see no reason to extend and compound that costly and ill-advised error by doing exactly the same thing again, ie, building a pipeline from Port Angeles to Clearbrook Minn.

The residents of Puget Sound, and Port Angeles in particular, are against constructing a super oil port in Port Angeles. The risks to the Puget Sound industries and amenities are obviously too great. Their opinions should, as a moral issue, be considered. They're citizens, too.

The logical alternative is the route that should have been built in the first place -- the route that follows the Alaska Highway down from Delta Junction. This route, too, would terminate in Minnesota and the other central states where the oil was needed in the first place. This route is the least disruptive environmentally; and it makes the most business sense.

Sincerely yours

Mr. and Mrs. Peyton Moncure

cc:

attachment/1

The attachment submitted with this letter was "Pipeline Looks Like Bad News for Western Montana", editorial by Sam Reynolds, from the *Missoulian*, March 8, 1979.

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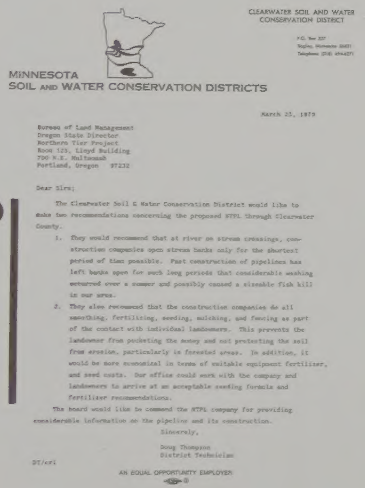

CLEARWATER SOIL AND WATER
CONSERVATION DISTRICT

MINNESOTA
SOIL AND WATER CONSERVATION DISTRICTS

March 23, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 125, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sirs;

❶ The Clearwater Soil & Water Conservation District would like to make two recommendations concerning the proposed NTPL through Clearwater County.

1. They would recommend that at river on stream crossings, construction companies open stream banks only for the shortest period of time possible. Past construction of pipelines has left banks open for such long periods that considerable washing occurred over a summer and possibly caused a sizeable fish kill in our area.
2. They also recommend that the construction companies do all smoothing, fertilizing, seeding, mulching, and fencing as part of the contact with individual landowners. This prevents the landowner from pocketing the money and not protecting the soil from erosion, particularly in forested areas. In addition, it would be more economical in terms of suitable equipment fertilizer, and seed costs. Our office could work with the company and landowners to arrive at an acceptable seeding formula and fertilizer recommendations.

The board would like to commend the NTPL company for providing considerable information on the pipeline and its construction.

Sincerely,

Doug Thompson
District Technician

DT/crl

AN EQUAL OPPORTUNITY EMPLOYER

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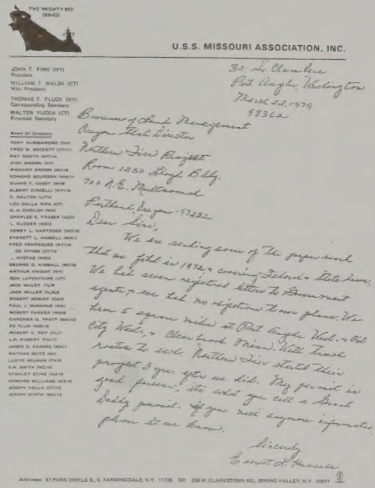


THE MIGHTY MO
(BB-63)

U.S.S. MISSOURI ASSOCIATION, INC.

JOHN T. FINN (NY) President
WILLIAM T. WALSH (CT) Vice President
THOMAS F. FLUCK (NY) Corresponding Secretary
WALTER YUCKA (CT) Financial Secretary

31 So. Chambers
Port Angeles, Washington
March 22, 1979
98362

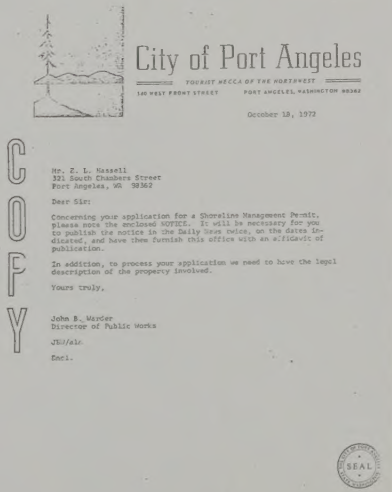
Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250 Lloyd Bldg.
700 N.E. Multnomah
Portland, Oregon - 97232

Dear Sirs;

❶ We are sending some of the paper work that we filed in 1972, covering Federal & State laws. We had seven rejected letters to Government agents, & we had no objections from planes. We have 5 square miles at Port Angeles Wash. & Oil City Wash., & Clearbrook Minn. With trunk routes to each. Northern Tier started their project 3 years after we did. My permit is good forever, its what you call a Grand Daddy permit. If you need anymore information phone & we know.

Sincerely
Everett L. Hassell

Address: 57 PARK CIRCLE S., E. FARMINGDALE, N.Y. 11735 OR 258 W. CLARKSTOWN RD., SPRING VALLEY, N.Y. 10977



City of Port Angeles
TOURIST MECCA OF THE NORTHWEST
140 WEST FRONT STREET PORT ANGELES, WASHINGTON 98362

October 18, 1972

COPY

Mr. E. L. Hassell
321 South Chambers Street
Port Angeles, WA 98362

Dear Sir:

Concerning your application for a Shoreline Management Permit, please note the enclosed NOTICE. It will be necessary for you to publish the notice in the Daily News twice, on the dates indicated, and have them furnish this office with an affidavit of publication.

In addition, to process your application we need to have the legal description of the property involved.

Yours truly,

John B. Warder
Director of Public Works

JBW/alr

Encl.

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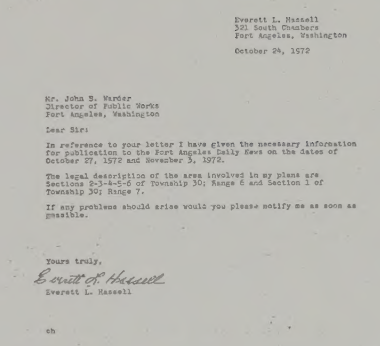

Everett L. Hassell
321 South Chambers
Port Angeles, Washington

October 24, 1972

Mr. John B. Warder
Director of Public Works
Port Angeles, Washington

Dear Sir:

In reference to your letter I have given the necessary information for publication to the Port Angeles Daily News on the dates of October 27, 1972 and November 3, 1972.

The legal description of the area involved in my plans are Sections 2-3-4-5-6 of Township 30; Range 6 and Section 1 of Township 30; Range 7.

If any problems should arise would you please notify me as soon as possible.

Yours truly,
Everett L. Hassell
Everett L. Hassell

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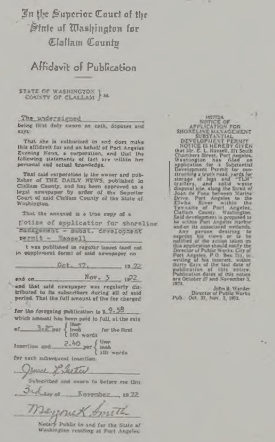

In the Superior Court of the
State of Washington for
Clallam County

Affidavit of Publication

STATE OF WASHINGTON } ss.
COUNTY OF CLALLAM }

The undersigned being first duly sworn on oath, deposes and says:

That she is authorized to and does make this affidavit for and on behalf of Port Angeles Evening News, a corporation, and that the following statements of fact are within her personal and actual knowledge.

That said corporation is the owner and publisher of THE DAILY NEWS, published in Clallam County, and has been approved as a legal newspaper by order of the Superior Court of said Clallam County of the State of Washington.

That the annexed is a true copy of a Notice of application for shoreline management - subst. development permit - Hassell

It was published in regular issues (and not in supplement form) of said newspaper on Oct. 17, 1972 and on Nov. 3, 1972 and that said newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is $9.58 which amount has been paid in full, at the rate of 3.2 per { line / inch / 100 words } for the first insertion and 2.40 per { line / inch / 100 words } for each subsequent insertion.

Janice L. Teter

Subscribed and sworn to before me this 3rd day of November, 1972

Marjorie K. Smith
Notary Public in and for the State of Washington residing at Port Angeles

107721A
NOTICE OF
APPLICATION FOR
SHORELINE MANAGEMENT
SUBSTANTIAL
DEVELOPMENT PERMIT

NOTICE IS HEREBY GIVEN that Mr. E. L. Hassell, 321 South Chambers Street, Port Angeles, Washington has filed an application for a Substantial Development Permit for constructing a truck road, yards for storage of logs and "TLH" trailers, and solid waste disposal site, along the Strait of Juan de Fuca between Marine Drive, Port Angeles to the Elwha River within the Townsite of Port Angeles, Clallam County, Washington. Said development is proposed to be within Port Angeles Harbor and-or its associated wetlands.

Any person desiring to express his views or to be notified of the action taken on this application should notify the Director of Public Works, City of Port Angeles, P.O. Box 711, in writing of his interest, within thirty days of the last date of publication of this notice. Publication dates of this notice are October 27 and November 3, 1972.

John B. Warder
Director of Public Works

Pub.: Oct. 27, Nov. 3, 1972.

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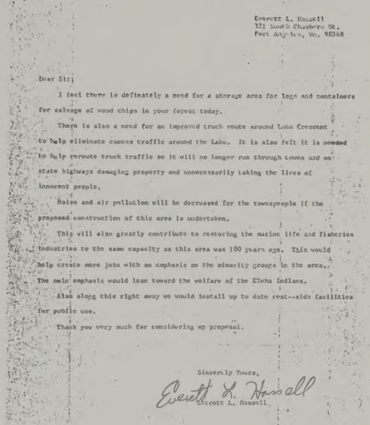


Everett L. Hassell
321 South Chambers St.
Port Angeles, Wn. 98368

Dear Sir;

I feel there is definately a need for a storage area for logs and containers for salvage of wood chips in your forest today.

There is also a need for an improved truck route around Lake Crescent to help eliminate excess traffic around the Lake. It is also felt it is needed to help reroute truck traffic so it will no longer run through towns and on state highways damaging property and unnecessarily taking the lives of innocent people.

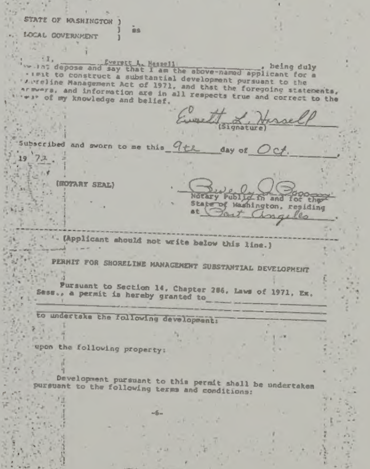
Noise and air pollution will be decreased for the townspeople if the proposed construction of this area is undertaken.

This will also greatly contribute to restoring the marine life and fisheries industries to the same capacity as this area was 100 years ago. This would help create more jobs with an emphasis on the minority groups in the area.. The main emphasis would lean toward the welfare of the Elwha Indians.

Also along this right away we would install up to date rest--side facilities for public use.

Thank you very much for considering my proposal.

Sincerely Yours,
Everett L. Hassell
Everett L. Hassell



STATE OF WASHINGTON }
} ss
LOCAL GOVERNMENT }

I, Everett L. Hassell, being duly sworn, depose and say that I am the above-named applicant for a permit to construct a substantial development pursuant to the Shoreline Management Act of 1971, and that the foregoing statements, answers, and information are in all respects true and correct to the best of my knowledge and belief.

Everett L. Hassell
(Signature)

Subscribed and sworn to me this 9th day of Oct., 19 72.

(NOTARY SEAL)

Beverly J. [illegible]
Notary Public in and for the State of Washington, residing at Port Angeles.

(Applicant should not write below this line.)

PERMIT FOR SHORELINE MANAGEMENT SUBSTANTIAL DEVELOPMENT

Pursuant to Section 14, Chapter 286, Laws of 1971, Ex. Sess., a permit is hereby granted to __________

to undertake the following development:

upon the following property:

Development pursuant to this permit shall be undertaken pursuant to the following terms and conditions:

-6-

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CONT.

NOTICE OF APPLICATION FOR
SHORELINE MANAGEMENT
SUBSTANTIAL DEVELOPMENT PERMIT

NOTICE IS HEREBY GIVEN that Mr. E. L. Hassell
321 South Chambers Street Port Angeles, Washington
has filed an application for a Substantial Development Permit for constructing a truck road, yards for storage of logs and "TLH" trailers, and solid waste disposal site, along the Strait of Juan de Fuca between Marine Drive, Port Angeles to the Elwha River.

within the Townsite of Port Angeles, Clallam County, Washington. Said development is proposed to be within Port Angeles Harbor and/or its associated wetlands.

Any person desiring to express his views or to be notified of the action taken on this application should notify the Director of Public Works, City of Port Angeles, P. O. Box 711, in writing of his interest, within thirty days of the last date of publication of this notice. Publication dates of this notice are October 27 and November 3, 1972.

John B. Warder
Director of Public Works

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**68**

March 21, 1979
Skagway, Alaska
P.O. Box 147

Bureau of Land Management
Northern Tier Project
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sirs:

As a resident of Skagway, the proposal by Foothills Pipeline Company to construct an oil tanker docking facility, tank farm and pipeline in Skagway concerns me.

① Skagway is located in a narrow valley, half a mile wide and perhaps two miles long. Steep mountainsides restrict growth.

My concern centers on such a large project as this pipeline coming into such a small area. I am sure that environmental safeguards will be foremost in the company's project to protect the area from the sort of disaster that unfortunately attends thoughts of crude oil transportation.

But the impact of this project on Skagway as we know it today will be enormous. The pipeline will literally make the town over in its own image. I am worried about the social impacts of noise, congestion and strains put on city services. As a public works employee, I know that our town's services are already at capacity.

With proper planning, these impacts may be mitigated to everyone's satisfaction. The construction phase, however, will be detrimental to everyone's quality of life here. Everything, so to speak, will happen on everyone's front step.

Once the pipeline is operating, I am worried about the degree of safety residents of Skagway will have with million-size oil tankers offloading regularly within the city limits. An explosion at the dock might level half the town.

Also, my concern for the large scale of this project includes the prospect of routine tanker traffic in Chatham Strait, Lynn Canal and Taiya Inlet. These are protected waters, but they are at places quite restricted, often prone to gale force winds and extreme tide differentials. Even the most sophisticated oil spill containment equipment would be helpless to prevent serious damage to these waters in the event of a spill. A large spill might ruin southeast Alaska's tourist and fishing industries.

Thanks for considering my concerns. Sincerely,

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**69**

STATE OF ALASKA
OFFICE OF THE GOVERNOR
DIVISION OF POLICY DEVELOPMENT AND PLANNING
JAY S. HAMMOND, GOVERNOR
POUCH AD - JUNEAU 99811
PHONE 465-3577

March 22, 1979

Mr. Albert Leonard, Manager
Northern Tier Environmental
  Statement Team
700 N.E. Multnomah, Suite 1250
Portland, Oregon 97230

Dear Mr. Leonard:

Enclosed is a copy of a letter we received from Mr. Mark Lewis, Manager of the City of Valdez. Mr. Lewis has expressed his concern over the options identified in your Northern Tier environmental statement.

We request that Mr. Lewis' letter be made part of the record of responses to the draft EIS.

Sincerely,

Jerry L. Madden
State-Federal Coordinator

Enclosure

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City of Valdez
OFFICE OF ADMINISTRATION

March 13, 1979

RECEIVED
MAR 16 1979
POLICY DEVELOPMENT
& PLANNING

Jerry Madden, State-Federal Coordinator
A-95 Clearinghouse
Policy Development and Planning
Pouch AD
Juneau, AK 99811

ATTENTION: Bruce Baker

Dear Mr. Madden:

Re: Northern Tier Pipeline Co.
State I.D. No. 79011806

The City of Valdez is quite concerned about this project as we feel there will be direct impacts upon Valdez, whatever route or method is chosen. We would appreciate our concerns being expressed at the public hearing scheduled in Juneau on March 19, 1979 and submitted to the Bureau of Land Management for their review. Our comments are based upon the following:

1. Valdez is the site of the existing oil pipeline terminal for Alaska crude oil;
2. Our local economy is partially dependant and would be effected by changes in outflow from that terminal;
3. The pipeline presently operates at only 60% capacity (1,200,000bpd) with future expansion of the West tank farm, expanded port facilities and increased jobs for our citizens somewhat dependant upon a decision regarding this project.
4. Alaska crude is presently shipped to the Arco Refinery at Cherry Point (100,000 bpd cap.) north of Bellingham, Washington, the Mobil Refinery (75,000 bpd) near Ferndale, WN., to San Francisco, Long Beach, Los Angeles and Panama. Some small amounts are also sold to the U.S. Oil Refinery near Tacoma. However, the present supply exceeds the refinery capacity of West Coast Refiners by 500,000 to 600,000 bpd. This excess is shipped via the Panama Canal to Golf of Mexico and East Coast Ports. Estimates are that this "glut" will get worse if pipeline capacity is reached in Alaska.

EXISTING REFINERY CONDITIONS - WASHINGTON STATE

(Anchorage Times - 2/7/79)

A. U.S. OIL AND REFINING (time oil) Tacoma - converting to use Alaska Crude 31,900 bpd.
B. ARCO AT CHERRY POINT - 100,000 bpd - built in 1972 for Alaska Crude.

Jerry Madden, State-Federal Coordinator
March 13, 1979
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C. SHELL - 91,000 bpd. - only uses 10% of Alaska Crude.
D. TEXACO - Anacortes - 78,000 bpd. - limited Alaska Crude.
E. MOBIL - Ferndale - 75,000 pbd. - 70% Alaska Crude.
F. SOUND REFINING - 12,000 bpd. Alaska Crude.

TOTAL Alaska Crude Refined in Washington - roughly 215,000 bpd.

The two (2) long range goals for the Northern tier project are to establish a reliable source of crude oil to northern tier states for next twenty years and to provide an improved system for transporting Alaska Crude East of Rocky Mountains.

ALTERNATIVES

1. No action or Delay Action.
2. Alternative Ports in Washington.
3. Alternative segments or routes for this system.
4. Totally different companies and routes.
5. Additional shipping to existing refineries or pipelines.

ANALYSIS

① 1. No Action or Delayed Action

As stated earlier, a 500-600,000 gallon "glut" already exists on the west coast. This substantially influences the growth of the Valdez section of the Alyeska Pipeline as they are unable to complete expansion potential.

2. Alternate Ports in Washington

The City of Valdez feels Washington Ports are a logical choice as a terminal site for Alaskan Crude. This assures shorter trips, faster turn around, maximum utilization of tankers and prevents additional ships being needed to transport further distances.

3. Alternative Segments

We have no comments...this section merely discusses alternatives to meet environmental or legal requirements.

② 4. Different Companies and Routes

The City of Valdez is quite concerned over the various alternates discussed.

(A) Alaska-Alberta (foothills) - this alternative proposes to take oil out of the existing pipeline at Delta Junction through Canada to various other refineries and pipelines in the northern Mid-West. Valdez is

Jerry Madden, State-Federal Coordinator
March 13, 1979
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concerned as this could potentially affect our community through loss in volume on the original pipeline. Valdez has been chosen as the site for the ALPETCO refinery processing 150,000 bpd of State of Alaska Royalty Oil. We are therefore very concerned over continued maximum flow through the existing line. Additionally, with all the delay and concerns expressed over the existing pipeline, what environmental effects will be generated by the foothills proposal? How does this proposal impact the D-2 lands or the Antiquities Act withdrawls by President Carter? Have the Canadian Lands Claims issue been resolved or will this be another delay factor?

③ (B) Kitimat Proposal - the second Canddian route, On both of the Canadian routes, the following questions are asked: If it is the major cutback in Canadian imports of oil creating the need for a pipeline, is it wise to consider Canadian routes?

(C) Trans-Mountain Pipeline Reversal - withdrawn at present. The biggest problem appears to be insufficient volume compared to other routes anyway.

(D) Long Beach - Midland Texas - while having the volume, this line involves longer ocean runs for the tankers and delivers oil far from the Northern market. This does not appear to actually provide the supply to the Source.

(E) Trans-Mexico - too many unkowns and again involves U.S. dependance on foreign route.

(F) Trans-Guatemala - some comments - also stated that Trans-Alaskan agreement requires U.S. control of transportation of American Oil. Does not the same apply for the other routes?

(G) Cape Horn - no specific proposal as yet but the longer ocean run stated would require larger tankers or more loading-unloading. Appears that Gulf Port destination still does not reach market area very easily.

④ (H) Transhipment-Panama - Foreign problems again. What of the new Panama Canal treaty? Is this a feasible alternative?

Jerry Madden State-Federal Coordinator
March 13, 1979
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⑤ Most all alternatives still have one basic problem! Are the Norther tier state refineries able to handle the "sour" crude? The pipeline should lead to those refineries and market areas for the end product. Additional routing, out of the way transshipments only add to the final costs.

In summary, the City of Valdez would probably favor the Northern route. Actual port location and environmental safeguards should be reviewed by the affected areas or States and it would be improper for us to suggest which of the WN. alternatives is selected. We do feel that the existing refineries and port areas should be reviewed. Additions to existing facilities, with known environmental risks, in a way, minimizes impacts by clustering, rather than starting all over with another area and spreading costs and risks over larger segments of the coastline.

Sincerely,

Mark Lewis

Mark Lewis, City Manager
City of Valdez

MS/mlc

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**70**

Office of Secretary ______ Telephone ______

Port Angeles Central Labor Council
AFFILIATED WITH
A.F.L.-C.I.O.
Washington State Federation of Labor
P. O. Box 488
PORT ANGELES, WASHINGTON

March 25, 1979

Bureau of Land Management
Northern Tier Project
Room 1250
Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Gentlemen:

Long ago the Port Angeles Central Labor Council took a stand against the Northern Tier Pipeline proposal.

Our original opposition was based on the fear that the Northern Tier project would have an adverse effect on our quality environment. Also, we were worried that approval of the Northern Tier project might force the closure of one or more of our mills and even limit activity in our harbor.

In spite of the fact that Northern Tier has had a Citizens' Information Office operating for more than a year, our original concerns have been intensified rather than diminished.

It is also striking that there exists in Port Angeles—and, we believe, in all of Clallam County—a consensus against the Northern Tier proposal. Public officials and organizations who often disagree on development issues are united against the Northern Tier proposal. Like the Port Angeles Central Labor Council, these public officials and organizations feel that their concerns about the environment and about our economic base have not been answered adequately.

We hope that the Bureau of Land Management will consider these legitimate local concerns.

Sincerely,

Richard E. Fisch

Richard E. Fisch,
Secretary-Treasurer

DEDICATED TO JUSTICE - BROTHERLY LOVE - CHARITY - FIDELITY

**71**

Box 248
Langley, Wa. 98260
March 24, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 NE Multnomah
Portland, Oregon 97232

To whom it may concern:

I urgently request a more complete EIS that addresses lands and waters which will be impacted on the new projected pipeline route, announced on March 23, 1979. The present EIS considers the lands and waters of other areas affected by earlier pipeline routes. Specifically, Whidbey Island and Camano Island are addressed briefly in the resource maps. The economic, environmental and social impacts will be extensive on these areas and must be addressed.

❶ Few people in this area know of or have seen the present EIS and are just now aware of the recently disclosed plans for the pipeline. I request an extension of the comment deadline date, April 2, until the EIS has been reviewed by the public here and public hearings have been scheduled.

❷ I have briefly reviewed the EIS for two days only and find very little in it pertaining to Whidbey Island lands, Seismic evaluation, water usage while the pipeline is in construction (water quantity is a serious problem here), the danger to the ground water supply in the event of oil leakage, the wildlife areas near the pipeline, parks in the vicinity and the fact that our aquifers underground provide most of the fresh water supply are questions which must be addressed in the EIS.

Thank you for your prompt consideration of this matter and the people it affects.

Sincerely,
Joan Tellini
Joan Tellini
Vice-President
South Whidbey Planning Council
Island Action Coalition
Save the Trees

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**72**

Mar 25-79
Haines, Alaska
17 miles south of
Skagway on Lynn Canal!

Dear Sir:

After reading all the pro's + Con's about the pipe line Foothills plans from Skagway to Red Rivers would like to make a few comments.

Have lived here all my life. My husband was employed at the Army tank farm here in Haines in Lutak harbor.

For nineteen years one hundred thousand barrel navy tankers docked in Lutak + pumped oil into tanks to pump to Fairbanks. During this nineteen years there was never a spill, + at times there were two tankers waiting to dock in a small harbor.

The fishermen who only fish three months out of the year + then only two days a week are not supposed to be in the shipping lanes.

Am all for this pipeline even though I live in Haines.

If the U.S. + our neighbors are ever going to be independent of the black mailers all Co over seas then it is time we started.

Sincerely,
Josephine Jurgeleit
Box 44
Haines Alaska
99827

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**73**

March 26, 1979

Bureau of Land Management
Room 1250
Lloyd Building
Portland, Oregon

Dear Sirs:

Northern Tier Pipeline has recently announced plans to route their project through an alternative route, submerged under Puget Sound, and overland on Whidbey and Camano Islands.

❶ Since this proposal is a major change and very little study was given to the environmental impacts with this alternate route, we are requesting a new environmental impact statement be drafted, dealing with the impact such a proposal would have going through these very sensitive lands and the rich environment of Puget Sound waters.

❷ Island County's water resources are mainly limited to ground water supplies. Possible contamination of these sources should also be investigated.

❸ The present EIS is unsatisfactory and inadequate with the change of the route through the sound and over the islands of Island County.

Sincerely,
Harriett K Hayes
Harriette Hayes, Ch. Island Action Coalition
1418 E. Rose Lane
Oak Harbor, Wa.
98277

Copies:
Island County Commissioners
Island County Planning Dept.

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**74**

24 March 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Sirs: Comments, NTPC DES

❶ You gave extensive instructions to your air quality contractor on coverage of climate. However, under Paragraph 3.1 on impacts of the project there is only one sentence. "The proposed project will have no significant impact on climate." This is an unsupported conclusion. There is not even a description of the Olympic rain shadow area in the eastern part of the county. The rainfall in the Sequim-Dungeness communities is 15 to 17 inches per year, not the 24 inches to 30 inches reported for Port Angeles. The moderate temperature and relatively dry and sunny skies are extremely valuable assets to the eastern part of Clallam County. These same rain shadow effects extend into portions of Jefferson, San Juan, and Island counties. See Attachment 1. An increase in rainfall in this region would be detrimental to health, life style and property values.

We have all heard of cloud seeding to intentionally increase rainfall. Seeding can also occur inadvertantly from air pollutants. Such increases in rain and fog are well documented as taking place several miles downwind from major sources of air pollution. If the rain shadow area is seeded with the hundreds of tons of air pollutants from an oil port there will be an increase in rain and fog. It may be acid rain and damaging to plant and animal life. Visibility of snow covered mountains and sea scapes would be reduced. Severity of respiratory ailments would increase.

This county has had little experience with air pollution compared with Los Angeles-Long Beach. Therefore, it is most disconcerting to read that an oil port smaller than the one planned for Port Angeles would increase air pollution over the entire Los Angeles Air Quality Region. A comparison of the size of this region with the Olympic Peninsula is provided in Attachment 2. If the port in Long Beach will affect such a large area, as claimed by the State of California, what will a larger port at Port Angeles do to the much smaller rain shadow area? This question should be fully answered in your Final Environmental Impact Statement.

The Draft Environmental Statement is sketchy in its discussion of crude oil chemistry. The failure to use realistic vapor pressures in computations of hydrocarbon emissions invalidates all sections of the DES where hydrocarbons or photochemical oxidants are discussed. Northern Tier has apparently directed that a Reid Vapor Pressure of 2.9 psia be used for North Slope Crude. By use of weighted averages for Reid Vapor Pressures some of the estimates for HC are only one fifth what they should be, for worst case situations. Three different air quality consultants on the Long Beach impact statement used 9.5 psia for True Vapor Pressure. Several references show typical Reid Vapor Pressures as 8 to 12 psia. See Attachment 3. Since many types of crude oil will be received by an oil port some of it should have typical vapor pressures. It is conceivable that crude oil with True Vapor Pressure of more than 11.1 psia will be handled several times a year. If so, the new tank farm must be constructed with vapor recovery systems. It is requested that vapor recovery systems be provided as a mitigating measure if the oil port is approved.

❷ Your contractor, Oceanographic Institute of Washington, claimed to have difficulty in getting information on the blast effects from chemical explosives such as TNT, natural gas, or vapors in oil tankers. They then used information from a nuclear weapons effects manual and scaled the results downward to predict blast damage from an oil tanker explosion. They computed that for the worst case with a 300,000 dwt tanker the vapors detonated would be equivalent to 625 tons of TNT. For this worst case it was claimed that moderate blast damage would take place within a 2250 foot radius and no damage to the City of Port Angeles from a Blast in the harbor was indicated. Information on blast effects from actual tanker explosions is readily available in U. S. Coast Guard reports of accidents. The Coast Guard reported property damage five miles away due to the Sensienna tanker explosion in Long Beach harbor. The Los Angeles Times reported glass breakage in Costa Mesa, 21 miles from the Long Beach explosion. One of the best pieces of work done on blast effects of chemical explosives was by Dr. Mel Cook, Univ. of Utah, for Dept of Army on Contract No. Da-04-495-ORD 907 in 1957. The test detonations were made at Umatilla Ordnance Depot, Umatilla, Oregon. Data gathered for the report show windows broken at the extreme range of 6,000 feet with only 12,000 pounds of explosive. Another reference, Attachment 4, Shows glass breakage at over 100,000 feet with only 50 tons of TNT equivalent explosives. The wide variation in ranges for blast damage is due to terrain and temperature inversions, primarily. There are frequent inversons over Port Angeles and with the city located on the upslope of the mountain, a tanker explosion in the Port Angeles harbor would be a real disaster. To locate a port in Port Angeles to handle explosive cargo without first conducting small scale test detonations to study the blast wave intensification from the terrain and temperature inversions would be unwise. Such tests should be considered as a mitigating action.

❸ Your DES seems to say that the crude oil received will be free of hydrogen sulfide and that there should be no concern as to odor or toxicity. Several sources show crude oils with 2% to 5% hydrogen sulfide. A more detailed coverage of this subject is needed.

❹ Information on oil spill trajectories from NOAA Report ERL 399-PMEL29, June 1978, "Circulation in The Strait of Juan de Fuca" should be include in the final draft of your statement. Also, obtain still unpublished results on drift cards in the 9600 series released in Port Angeles harbor. It is understood that these cards were found from Green Point to Dungeness Spit and then on Whidbey Island as far south as Pt. Casey. This drift may help to answer the question whether there is really an additional oil spill safety factor for the San Juan Islands and Whidbey Island by locating an oil port at Port Angeles rather than Burrow's Bay. Such a comparison should be part of the discussion of Alternate Sites. This comparison is even more essential now that Northern Tier proposes to take their pipeline under the Sound.

❺ There is not full disclosure of the pollution possibilities with oil contaminated water at the tank farm. It appears that over 1,000,000 gallons of water previously exposed to oil would be released to Siebert Creek on certain days. In lieu of oil separators and release to the creek it is proposed that the contaminated water be collected in a separate tank and returned to the harbor through a separate pipe line and used as ballast water.

❻ Purging of cargo tanks should either be treated as a worst case hydrocarbon emission or covered more fully in the DES. Describe the emergency conditions under which purging would be performed in the harbor. Purging 10 or 20 miles from the harbor is not acceptable. Purging should be performed at least 36 hours pollutant travel time from the Puget Sound non-attainment area for photochemical oxidants.

❼ Proposals to control sulfur dioxide emissions by burning low sulfur fuel are not acceptable unless provision is made for in stack monitoring of emissions and inspections by Coast Guard to verify use of the low sulfur fuel. An alternative mitigating measure would be to provide bonnets over the tanker stacks and treat all air pollutants to acceptable levels.

❽ By August 1979 there should be Prevention of Significant Deterioration standards for nitrogen oxides as well as for sulfur dioxides and particulates. There is very little information in the DES on nitrogen oxides. Use Draft "Air Quality Criteria for Oxides of Nitrogen, November 1978" and comment on Northern Tier's ability to control ship emissions as necessary to avoid effects on visibility, animals, vegetation, human sensory systems, human pulmonary systems and acute respiratory illnesses.

❾ Now that Northern Tier has committed themselves to a pipe line under water to Whidbey Island your new DES must reveal fully the impacts of a 1,283,000 bpd throughput of crude oil on the Olympic Peninsula. There is very little impact information for this quantity of crude in the current DES. Environmentalists in the greater Seattle area continue to insist that Washington State refineries be supplied crude oil by pipe line from Port Angeles. You should no longer present mutually exclusive stories in the same statement, both favorable to Northern Tier Pipeline Co. If you continue to let Seattle residents think tanker traffic to the refineries will be reduced by a pipeline you must start telling the environmental facts to the Olympic Peninsula residents about a 1,283,000 bpd crude oil terminal.

❿ A full and conspicuously placed treatment of the alternative of an oil trade with Japan is needed. Include this subject in your Summary. The Olympic Peninsula and its adjacent waters are too valuable a resource to risk damage because of a midwest vs. west coast political squabble. Include the economic and employment advantages of preserving the Strait and the remaining clean portions of the Sound for aquaculture.

⓫ Routing the pipeline under water to Whidbey Island and the above listed deficiencies and omissions will be most difficult to cover without extensive rewrite of the DES. It is recommended that a new DES be prepared and circulated for comment.

Sincerely,
Homer V Frazier
Homer V. Frazier

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**75**

PORT ANGELES LOCAL NO. 155
ASSOCIATION OF WESTERN PULP AND PAPER WORKERS
P. O. Box 2066
PORT ANGELES, WASHINGTON 98362

March 27, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Bldg.
700 N. E. Multnomah
Portland, Or. 97232

Gentlemen:

Local 155 of the Association of Western Pulp and Paper Workers would like to go on record in opposition to preferred status offered Northern Tier.

❶ The two items we most strenuously object to are:
1) The preferential status in regards to power, and;
2) The amount of air pollution generated by N. Tier which will limit the expansion of existing industries already in the area.

Local 155 represents the workers in both I.T.T. Rayonier and Crown Zellerbach in Port Angeles. Both of these mills have been in operation for many years. Local 155 members have a vital interest in this matter, and we feel that for another industry to locate in this area and be given preferential status over existing industries is completely unfair.

Thanks for your consideration.

Sincerely,
William D. Ensor
William D. Ensor,
Pres., Local 155, AWPPW

**76**

STATE OF WASHINGTON
Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION
7150 Cleanwater Lane, Olympia, Washington 98504

March 26, 1979

35-2650-1820
Draft EIS - Crude Oil
Transportation System
(E-1492)

Oregon State, Director
Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sir:

The staff of the Washington State Parks and Recreation Commission has reviewed the draft Environmental Impact Statement for the Northern Tier Pipeline and offers the following comments. General comments pertaining to the impacts of the pipeline on lands under State Park jurisdiction will be presented first. Comments addressing specific points in the draft EIS will follow.

① Potentially, 12 State Parks may be impacted by the proposed Northern Tier Pipeline and associated facilities. These parks are:

Dungeness Spit
Sequim Bay
Dosewallips
Pleasant Harbor
Scenic Beach
Lilliwaup Tidelands
Potlatch
Millersylvania
Flaming Geyser (including 5 other sites in the Green River Gorge Conservation Area)
Nolte
Ollalie (including Twin Falls Natural Area)
Lake Easton

Dosewallips, Millersylvania, the Jellum and Palmer sites in the Green River Gorge Conservation Area, Nolte, Ollalie and Lake Easton are within a mile of the pipeline (within the two mile corridor). All other parks are outside this corridor, but are downstream from a point where the pipeline will cross a stream or river, or are downhill from the pipeline route.

② Impacts on most of these parks will occur during all three phases of the pipeline: construction, operation and abandonment. Visual impacts will occur where the pipeline can be seen from State Parks property. Parks that would be visually impacted are Sequim, the Jellum and Palmer Sites on the Green River, Nolte, Ollalie and Lake Easton. Excessive noise during the construction and abandonment phase would impact these same parks except Sequim.

③ In the event of a tanker spill or pipeline rupture all parks except Millersylvania could be severely impacted; part of the parks' natural amenities may be destroyed or no longer available for public use for quite some time. Sequim Bay State Park's surface water supply system may be rendered useless in the event of a pipeline rupture upstream.

Erosion during construction and abandonment phases may have significant impact on the parks using a stream, river or marine shore as part of its recreational resource.

The following comments will address the contents of the draft EIS:

④ Page 1-11 Tanker Unloading Facilities. A floating boom will be placed around each tanker after docking and before unloading. How much area will the floating boom cordon off? Without knowing the area involved, the degree of interference with recreational boaters and shore-based recreationists cannot be determined. This needs thorough evaluation in the final EIS.

⑤ Page 1-22 Table 1.4-8. Clallam, Jefferson, Mason, Thurston and Pierce counties have been omitted from the minor stream crossings list.

⑥ Page 2-31 Figure 2.1.1.12-1. If this figure represents current land use rather than current zoning, it should designate parts of the shoreline on the upland side of Dungeness Spit for recreational use. This is the site of Dungeness State Park. Also, several other recreational areas are not identified: Striped Peak, the viewpoint on Freshwater Bay, the city parks in Port Angeles, the Olympic National Park Visitor Center and that portion of the Park within the 10-mile radius of the tanker berths.

⑦ Page 2-37 Recreational Resources - Pacific Coast. Although road access to parts of the coast is limited, it receives significant use from late spring to early fall and winter use is increasing rapidly.

⑧ Camping is a significant recreational activity in North Puget Sound, parts of the Strait of Juan de Fuca and much of the Pacific Coast yet it is not mentioned in this section.

⑨ Page 2-46 Social and Economic Conditions. Millions of visitors come to the Olympic Peninsula each year, not "thousands" as is stated in the draft EIS.

⑩ Page 2-57 Aquatic Resources. The criteria for determining what is a "major" stream crossing should include each stream's recreation and natural resource values. Using physical criteria for determining what is "major" is inadequate and can be misleading as to the total value of each stream or river as a resource.

⑪ Page 3-17 In-Transit, At-Berth and Tank Farm Oil Spill Risk. It is stated that "the estimates (spill frequency) are valid only if conditions do not change significantly from historical patterns." Historical patterns for the physical conditions (weather, currents, tides, etc.) in the Strait of Juan de Fuca exist. However, the historical patterns for large tanker traffic in the Strait do not exist because very few tankers of the size proposed have ever entered the Strait. How can spill frequency for in-transit tankers traffic be generated if this data does not exist? If the in-transit data comes from other sites how can it be valid for the Strait of Juan de Fuca?

The data presented for spill frequency and predicted spill pathways is for an undertermined amount. What is the worst possible case?

What will be the long-term effects of small, frequent spills?

⑫ Page 3-37 Visual Resources. Hurricane Ridge and the road leading to it offer spectacular views to the north. Ediz Hook and Green Point are clearly visible from major viewpoints. The tanker berths and facilities and the tank farm will definitely intrude upon these views.

**CONT.**

⑬ Page 3-47 Recreation Resources. It is stated that "curtailment of use of the Port Angeles-Victoria auto ferry would affect an indeterminate number of recreationists..." How and when will ferry operations be curtailed? What would be the loss to ferry users and the Washington State Department of Transportation in terms of convenience, availability of transportation, revenues, etc?

In evaluating the impacts of tanker accidents and pipeline ruptures on recreation, economic data showing the dollar value of potentially impacted recreation facilities and activities needs to be presented. Recreation is a significant part of the state's economy. Residents of Washington and both out-of-state and foreign tourists pursuing recreational activities support some of the larger industries in the state. Activities such as recreational boating, shellfish harvesting and sports fishing provide some of the largest economic benefits to the state.

Data reflecting these economic benefits must be presented. Use data for established recreational sites and facilities is also essential in assessing the impacts of the pipeline.

⑭ Page 3-48 A tanker spill off of Neah Bay may adversely affect the Olympic National Park Wilderness Beaches along the Pacific Coast.

⑮ Page 3-50 Social and Economic Conditions. The assumption that "damages from an oil spill to aesthetic and recreational values would have a minor effect on tourism" is false. Effects may be minor to severe. The effects of a massive oil spill on the motel business of the city of Santa Barbara cannot illustrate the total impacts of an oil spill of the same magnitude in the Strait of Juan de Fuca or in Port Angeles Harbor.

⑯ Page 5-10 Unavoidable Impacts. A marina and a boat launch facility in Port Angeles Harbor will be lost to recreational boaters. The disruption of the harbor and boating traffic caused by the Northern Tier port facility will impact water-related recreational activities. Construction, operation and abandonment of the pipeline and related facilities will have minor to severe impacts on recreation. Some impacts will be short-term, others long-term. Oil leaks and spills will possibly be detrimental to recreation. All the disruptions or damage to recreation activities and resources will cause an economic loss to the State of Washington and its citizens which may be long-term and of a significant magnitude.

⑰ Page 6-2 Onshore Storage Facilities. "The notch may also change erosion rates on the cliff, and thereby affect the deposition of silts and sands on Dungeness Spit east of Green Point." Anything that may change the erosion rates of the bluffs west of Dungeness Spit will alter the accretion rates of the spit. If breaching of the spit occurs more frequently due to erosion control measures at the bluffs, severe damage may occur to the spit and its resources. This is particularly true in the event of an oil spill when the spit has been breached. This must be considered as a very severe potential adverse impact upon recreation and the natural resources of the area.

Page 8-37 Low Point-Preferred Alternative. This alternative port site will have fewer impacts on recreation than the Port Angeles site. Marine facilities, harbor and ferry traffic would not be disrupted as is the case with Port Angeles port site although tanker traffic and the offshore single point mooring systems will interfere with recreational and some commercial boating traffic.

⑱ Tanker accidents on route to or docking at Low Point will have much the same impact as accidents occurring on route to or in Port Angeles Harbor including possible damage to Dungeness Spit (see comment under "Page 6-2 Onshore Storage Facilities"). Pipeline leaks and spills will affect an additional 24 rivers and streams, many which have high recreation and natural resource value. Pipeline spills at stream and river crossings will also impact the shoreline along the Strait of Juan de Fuca.

⑲ Page 8-43 Recreation Resources. In the event of a spill at Low Point many recreational activities and facilities in the Strait of Juan de Fuca, the San Juan Islands and Canada may be severely impacted. These impacts may be short or long-term. Once again, economic data showing the dollar value of potentially impacted recreational facilities and activities needs to be presented to fully evaluate the impacts.

Erosion and bottom sediment disruption during the construction and abandonment phases of the port facilities and pipeline may have significant impact on areas with high recreation and natural resource value.

⑳ Page 8-49 to 57 Cross Puget Sound Alternative. Potentially 13 parks will be impacted by this proposed alternative pipeline route. These parks are:

Dungeness Spit
Sequim Bay
Fort Worden
Old Fort Townsend
Fort Flagler (including Mystery Bay Recreation Area)
Fort Ebey
Fort Casey
Joseph Whidbey (Whidbey Island NAS)
Deception Pass
South Whidbey
Camano Island
Ollalie (including Twin Falls Natural Area)
Lake Easton

Fort Ebey, Joseph Whidbey, Ollalie and Lake Easton are within 1 mile of the pipeline. The pipeline passes through the proposed development at Joseph Whidbey State Park. All other parks are along shorelines that may be impacted during the construction, operation and abandonment phases depending on the currents, tides, wind and weather.

In the event of a pipeline leak or rupture all these parks may be severely impacted. (In addition to these parks, the Washington State Parks and Recreation Commission owns and operates a dozen marine parks and miscellaneous small islands in the San Juan Islands. Any of these may also be impacted by a pipeline rupture.) The visual impact would be great under these circumstances. Many recreational activities would be lost for a short or long duration. Natural amenities of each of these parks may be lost (shellfish and fish resources, etc.). Some facilities may be damaged. Bottom sediment disruption or land erosion during construction and abandonment phases may have significant impact on the shoreline or water related activities of each of these parks.

㉑ Page 8-51 Marine Resources. A leak detection system capable of sensing a 0.5 percent loss of throughput volume is highly inadequate. This means over 148,000 gallons per day during the initial throughput or over 195,000 gallons per day during the final throughput may go undetected until sighted. There are many times in the Northern Sound and the Strait when the weather conditions could prevent the oil from being sighted immediately.

㉒ Page 8-56 Recreation Resources. There are two state parks proposed for development in the pipeline corridor: Fort Ebey and Joseph Whidbey. (see comment under "Page 8-49 Cross Puget Sound Alternative")

A more in-depth analyses of impact of this proposed pipeline on recreation activities and resources is needed. Economic data needs to be presented.

㉓ Page 8-60 Stampede Pass Route Alternative. Lake Easton State Park would still be affected by the pipeline and the impacts are the same as those stated for the original proposal.

㉓ Page 8-61 Naches Pass Route Alternative. Federation Forest State Park will be impacted by this alternative route segment. The park is within one mile of the pipeline and is downstream from the crossings of the White and Greenwater Rivers. Impacts may be visual and aesthetic. Water quality of the rivers may be degraded. Oil spills may impact recreation.

In summary, all phases of the Northern Tier Pipeline and associated facilities may adversely impact recreation activities, specific facilities, and the natural resources that enhance recreation. The impacts may be short term, long term or permanent. The draft environmental impact statement does not provide adequate information to determine the full impact of the pipeline on recreation resources in the State of Washington. More detailed and additional information is needed in order to fully assess the impacts.

Thank you for the opportunity to review and comment on the Northern Tier proposal.

Sincerely,

David W Heiser

David W. Heiser, E.P., Chief
Environmental Coordination

DWH/NAM:jc

cc: Mike Mills, Policy Analysis Division
Office of Financial Management

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**77**

BARBARA D. KALEN
Box 317
Skagway, Alaska 99840

[illegible] 1979

Bureau of Land Management
Oregon State Office
729 N. E. Oregon St.
Portland, Or. 97232

Dear Sirs:

① I wish to confirm, and add to my oral testimony concerning the [illegible] proposal for a tanker port at Skagway, and an oil pipeline over the White Pass, following the [illegible] right-of-way. I feel that the strongest argument against this is the danger to fisheries in Southeast Alaska from possible oil spills. Fishing is a multi-million dollar business in Southeast Alaska, supporting many fishermen, their families, and businesses in nearly every town.

All of our waters from Chatham Straits north to Lynn Canal would be endangered—it would be very possible that a single spill could wipe out large portions of the salmon runs if they happened at a time when spawners or fingerlings were in the affected area—the same could happen to the herring, which are the foundation of the food chain, and food for many other larger species. It would not matter that in a few years the waters and beaches would recover—a run destroyed is gone.

Just look at the rest of the world and ask what pollution by man has done to the Atlantic salmon runs in Europe, on the East Coast of north America, the salmon that used to run in California rivers, the rapidly diminishing runs in the Columbia river and Puget Sound?

Throughout the world man is losing resources by overfishing and pollution—both effective ways to destroy the fish. A crisis in nearly all of the third world is the simple matter of firewood. Villagers are [illegible] miles and miles, cutting every tree and bush, so that there will be nothing available for their children in a few short years time. The same thing happens with grazing land, and water tables, where ground water that has taken centuries to accumulate is being lowered for irrigation, and often (and often, in the U. S. at least, for luxury uses). Thousands of acres of land throughout the world are turned to desert each year by man's short-sighted overuse for the present, and I feel that this global problem must be solved by a much stronger search for alternate energy sources, and a real turnaround to truly effective use of technology and a halt of the present business practices of planned obsolescence. This line of thinking is very relevant to the whole question of whether this pipeline needs to be built at this place at this time, and I hope you will give it some consideration.

To get back to our local problems, assuming that the Federal Government does decide to push for this line anyway: the Northern Tier proposal outlined in the booklet given out at the Skagway meeting Feb. 20 estimates that 112 acres of the harbor in the Port Angeles area would be impacted. Skagway does not have this much harbor for all of the uses presently accommodated—general cargo, bulk ore, tour ships, ferries, small boat harbor, and barge traffic. That is going to get squeezed out by the addition of a large tanker nearly every day. Tour ships, for example, contribute a great deal to Skagway's economy. Total tourist contribution to Skagway, in the form of rail tours, hotel lodging, sightseeing, restaurants, souvenirs, summer jobs to accommodate these people, can be estimated at from 1/3 to 1/2 of Skagway's total economy.

Again, the Northern Tier proposal calls for a 90 foot wide construction corridor, and a 75 foot permanent right of way corridor. There are several places on the White Pass where this is literally impossible. Most of the slope is [illegible] so steep, that they are naturally unstable,

continually eroding, and building talus slopes. Any disturbance, and a trench large enough for a 24" pipeline is surely going to be a disturbance, makes the land that much more unstable. The WP&YR has experienced both rock and snow [illegible] every year since it was built. It is relatively easy to repair rail and ties, and to recover locomotives and other rolling stock fallen off the right-of-way is not [illegible] to the land and water as a broken large oil line and spill could be. Mention has been made of the negligible damage from the 4" pipeline north from Skagway, and the 8" line north from Haines, both of which have suffered breaks, the Skagway one many more than the Haines, due to our terrain. I think the difference in capacity between these little lines and a 24" one makes such a comparison of little value. In our narrow canyon, with porous sand and gravel overlaying bedrock, a spill would rapidly percolate into the water table, and could make Skagway's water supply unusable for many years.

A construction camp nearby could create short-term problems for water and sewer, garbage disposal, police and school needs, which could prove a greater expense to the city than the extra money the workers would spend. All previous experience of construction workers in Skagway, elsewhere in Alaska, and probably all over the world is that the bulk of their wages gets blown on liquor and gambling, and does not benefit the total economy very much. Those workers who do not blow their money will save it, and spend it when they get back to their stateside homes.

Which brings up the subject of who will get these jobs, anyway? How many Alaskans will be hired, or trained, for the jobs? The Alyeska experience suggests "not very many." We also find ourselves wondering about the total number of real jobs operating the facility after it is built. 60 sounds like an inflated figure for an automated operation. We've heard some local citizens crying about the small present prospect of jobs for our high school graduates, but this is a fact that has been with Skagway ever since the town was founded. Kids who get an education, especially if they go on to college, have never found satisfying job opportunities in Skagway. How many of these pipeline jobs would go to local H. S. grads? Would they not go instead to highly trained, experienced personnel from some place else, or will our local people be given a chance to be trained?

Has any serious consideration been given to using the port, tank farm, and right-of-way at Haines? We still feel that tanker traffic in S. E. waters is highly undesirable, but if national policy dictates a pipeline in this area, it seems to some of us that there is better and larger berthing room at Haines, plus a great deal more flat land for everything, and a much less hazardous right of way for the pipeline, following the existing pipeline from Haines to the Alaska Highway.

Real estate assessments in Skagway have gone up 700 to 800% in the past ten years, and cost of business has risen [illegible]. Experience here during W. W. II and during the Alcan boom indicates that any further pressure would raise prices still more—and outside speculators would force prices right out of sight. Especially as Skagway does not have enough land to support very much reasonable expansion—much of what is vacant is held by owners who refuse to sell at any price.

Yours very truly,

Barbara D. Kalen

Barbara D. Kalen

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**79**

ISLAND COUNTY
Historical Society
Formed in the interest of preserving the history of Island County
P.O. Box 305
Coupeville, Washington 98239

March 28, 1979

Bureau of Land Management
Room 1250 Lloyd Building
Portland, Oregon 97232

Gentlemen:

① Regarding the Northern Tier Pipeline Company's proposal for an oil port and oil pipeline in Washington state: We feel the EIS of this proposal should be rewritten and resubmitted to reflect the major route change announced by Northern Tier March 23, 1979.

This route change may have a drastic adverse impact on the historical character of Whidbey and Camano Islands and their surrounding waters, which are under the auspices of the Island County Historical Society. This area is of great national importance historically and has been recognized as such many times by the Federal Government.

We have had no opportunity to study and assess this proposal regarding how it would affect Island County's historic and aesthetic character.

We request public hearings on this proposal. We also desire to be included in all hearings, meetings, documents, mailing lists, etc. concerning this proposal.

Thank you.

Sincerely,

ISLAND COUNTY HISTORICAL SOCIETY

Joan McPherson

Joan McPherson
Historic Preservationist

Copies to:
United States Senator Warren G. Magnuson, United States Senator Henry Jackson, United States Congressman Al Swift, State Senator Pat Wanamaker, State Representative Sim Wilson, State Representative Joan Houchen, Island County Commissioners, Island County Planning Department

**81**

March 28, 1979

Bureau of Land Management
Room 1250, Lloyd Building
Portland, Oregon, 97232

RE: Environmental Impact Statement
Northern Tier Pipeline Crossing
Whidbey and Camano Islands

Gentlemen:

It has come to our attention that the Environmental Impact Statement for the Proposed Northern Tier Pipeline does not give adequate attention to its impact on the Puget Sound Crossing and its impact on Camano Island.

As residents and homeowners on a unique scenic/residential/agricultural/forestland Island, we must be fully apprised of the pipeline's impact.

Our concerns include:

① 1. The effect of construction on our tidelands. What will happen to our natural tidal channels which were disrupted by the previously installed gas pipeline?

2. The effect of an underwater rupture due to earthquake or accident, particularly in view of the fact that no automatic shut-off controls are planned where the pipeline enters or leaves the water.

3. The effect of a 75 ft. wide right of way on the adjacent property values and the environmental and scenic values on Camano Island. This is extremely important since no structures or plantings would be planned nor permitted.

4. The effect of a pipeline rupture on our water aquifers where they will be intercepted by the pipeline.

② We feel that our rights and concerns are being ignored, and respectfully request that steps be taken to make certain that an E.I.S. specifically addressing the concerns of Camano and Whidbey Islands be required.

Sincerely,
Wm. P. Dunlop
Wm. P. Dunlop, for
CAMANO ISLAND HOMEOWNERS ASSOCIATION
1559 N. Hultman Rd., Camano Island, 98292

cc: Honorable Henry M. Jackson
Honorable Al Swift
Honorable Pat Wanamaker, Joan Houchen, Sim Wilson
Honorable Christian, Rouco, Anderson - County Commissioners
Sydney W. Glover, Island County Planning Director
Mr. Bruce L. Foxworthy, U. S. Geological Survey
Stanwood NEWS

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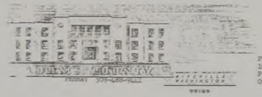
**82**



Planning Dept.
1045 E. Main
P.O. Box 334
Othello, WA 99344

March 28, 1979

Bureau of Land Management
Northern Tier Pipeline Project
Room 1250
Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sir:

Enclosed are Adams and Lincoln Counties comments on the B.L.M. Draft Environmental Statement dealing with the proposed Northern Tier Pipeline Project.

We hope these comments will be of help to you in better accessing Adams and Lincoln County needs in dealing with the proposed pipeline project.

If you have any questions or comments, please don't hesitate to contact us.

Sincerely,

Paul Danielson
Associate Planner

John Taylor
John Taylor
Planning Director

JT:jkn

cc. Doug Miler

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**A**

LINCOLN COUNTY

Review of Draft Environmental Statement
by the Bureau of Land Management
on the Proposed Northern Tier Pipeline Project

In our study of the Bureau of Land Management Environmental Statement, several strong points were revealed. These points are helpful to us in accessing Lincoln County's concerns in view of the proposed construction of the Northern Tier Pipeline.

The existance of a waterfowl nesting area the the upper end of Sprague Lake is shown in the B. L. M. document to be significant.[1] Knowledge of this will help to access possible damage due to an oil spill in Sprague Lake.

An area in Lincoln County, along the pipeline route, was shown to have critical water erosion potential in the B. L. M. document.[2] Significant slope instability and liquification potential exist in certain areas of Lincoln County along the proposed pipeline route according to the B. L. M. Map Addendum, pages 85-87. The B. L. M. Map Addendum soil information is easy to interpret compared to more complex soil survey data, and has helped show us the need for extreme erosion control measures in places along the Lincoln County pipeline route.

The general organization of the report material was good, in that we were able to find whatever information we needed on the various subjects we studied, among the material covered in the B. L. M. document.

In our studies of the B. L. M. Environmental Statement, several weak points were brought out.

① The report in general was not detailed enough to cover most local problems adequately. For example, a map showing the probability of an oil spill mile by mile along the proposed pipeline route would have been helpful, along with the provided topographic information, in accessing whether proposed placement of mainline valves is adequate to protect county needs.

The environmental and soil characteristics maps were, in some cases, not detailed enough to cover the entire 2 mile wide pipeline corridor.

1. B. L. M. MAP Addendum, p. 86 & 87
   B. L. M. Environmental Statement, p. 2-100
2. B. L. M. Map Addendum, p. 84-87
   B. L. M. Environmental Statement, p. 3-63

② Some research done in the B. L. M. document was incomplete. For example, extensive study was done on the types of crops that would be most affected by an oil spill into a canal system. The amount of time required for soil recovery and methods of conditioning soil to speed recovery were discussed.[1] Nothing was discussed, however, on the number of acres of land which would be affected.

③ In some cases, our study of the B. L. M. document raised questions. Conflicts of data were found in comparing the B. L. M. document with other sources of information. One example of this is the claimed existance of the 36" Pacific Transmission Company natural gas pipeline in Lincoln County; we found no information on this pipeline anywhere but in the B. L. M. Environmental Statement on page 2-134.

1. B. L. M. Environmental Statement, pages 5-21, 3-105 and 106, 1-59

ADEQUACY OF B. L. M. DOCUMENT
in COMPLEMENTING SPECIFIC PROBLEM STATEMENTS

A - 1a. PROBLEM STATEMENT: There would be a break in the irrigation schedule, which would damage cropland if the pipeline canal crossing is built during the irrigation season and the East High irrigation canals are in service (Vol. II; Application for Site Certification; p. 6-105).

A - 1b. PROBLEM STATEMENT: An oil spill into the propsed East High Canal systel would damage hundreds of thousands of acres of cropland downstream in Adams, Grant, Lincoln, and Franklin Counties (U. S. B. R. Columbia Basin Project map; Jan., 1977).

REVIEW COMMENTS: The B. L. M. Environmental Statement made mention of the fact that ground saturated with oil from an oil spill into an irrigation system could take from one to five years to recover, but that cultivation and fertilization would speed this recovery process.[1] Types of crops most susceptible to oil contamination are mentioned, as well as pipeline inconveniences to irrigated land, (leveling, canal construction, etc.) in the B. L. M. document.[2] The B. L. M. made the statement on page 3-105, in the Environmental Statement, that 3' may not be a sufficient burial depth for the pipeline in agricultural areas. It was also stated that planning and timing will be needed to lessen pipeline impact on future irrigation projects like the proposed East High project.[3]

1. B. L. M. Environmental Statement, p. 5-21, 3-106
2. B. L. M. Environmental Statement, p. 5-21, 3-106, 3-105
3. B. L. M. Environmental Statement, p. 1-59

④ B - 1a. PROBLEM STATEMENT: Some of this area is characterized by soil with a permeable gravel underlay where a small pipeline leak of 2-5 gpm would go undetected at the surface of the ground, thereby polluting the environment (Vol. II, Part II; Application for Site Certification, p. 2.11-70, and Adams County Soils Survey map, p. 8).

REVIEW COMMENTS: Soil types and characteristics are discussed in some detail in the B. L. M. Environmental Statement; permeability is also discussed to some degree.[1] No apparent discussion is made on the subject of oil permeability in soils, however, in the B.L.M. document.

⑤ B - 2a. PROBLEM STATEMENT: Open pipeline trench or construction equipment will harm or restrict range animals during pipeline construction.

REVIEW COMMENTS: The B. L. M. Environmental Statement mentions that open pipeline trench and construction equipment operation could cause livestock injuries or fatalities.[2] On page 1-44 in the B. L. M. document, it states that the pipeline trench will be open for as short a time as possible. The reviewer found nothing in the B. L. M. report about skipping sections during construction so range animal movement would not be hindered.

CONT

B - 3a. PROBLEM STATEMENT: An insufficient number of block and check valves are currently proposed for the Sprague Lake drainage area, increasing the probable volume of an oil spill in that area (Vol. IV; Application for Site Certification, p. 806170).

PROBLEM STATEMENT: Too few mainline pipeline valves have been proposed for the Northern Tier Pipeline in the Negro Creek - Sprague Lake drainage; the potential volume of oil spilled during an oil spill will therefore be excessive. (Vol. IV, Application for Site Certification, p. 806170).

1. B. L. M. Map Addendum, p. 84-87 and p. 127-128
   B. L. M. Environmental Statement, p. 2-54 to 2-55
2. B. L. M. Environmental Statement, p. 3-104

REVIEW COMMENTS: The characteristics and location of mainline valves are given in the B. L. M. Environmental Statement on pages 1-24 and 1-25.

As mentioned earlier, the reviewer would be in favor of a map or list showing areas where the probability of an oil leak or spill would be greater than the pipeline average. With this information, Lincoln County personnel could plan, with the use of topographic data, where block and check valves should be placed in Lincoln County.

⑤a Department of Transportation regulations regarding the placement of mainline valves are discussed; however, no indication of adequacy in protecting Lincoln County is given in the B. L. M. document.[1]

C - 1a. PROBLEM STATEMENT: If careful planning is not implemented, on the part of the pipeline company, traffic will be slowed on Interstate 90. (Vol. III, part II, pages 5-53) (Vol. II, Application for Site Certification, p. 6-147).

REVIEW COMMENTS: The B. L. M. document on page 2-127 states that 8,200 vehicles per day used Interstate 90 in 1976 in the area of the proposed pipeline crossing. The B. L. M. mentioned that interstate highway crossings will probably be bored or tunneled with little or no traffic disruption.[2] The reviewer believes that the pipeline will be placed under I-90 at the Lincoln County road 9220 underpass just east of the I-90 Sprague rest areas.

The B. L. M. did mention the possibility of damage to transportation or utility systems near the pipeline construction site.[3] On page 5-22, the B. L. M. document states that oil spills or oil spill cleanup activities could damage transportation or utility networks.

⑥ C - 3a. PROBLEM STATEMENT: Pipeline construction activities at the Negro Creek crossings will cause excess sedimentation downstream in Negro Creek and Sprague Lake. (Vol. III, part II, Application for Site Certification, p. 5-8).

1. B. L. M. Environmental Statement, p. 1-24 and 1-25
2. B. L. M. Environmental Statement, p. 3-108
3. B. L. M. Environmental Statement, p. 5-21

REVIEW COMMENTS: Negro Creek is not mentioned in the B. L. M. document in the water quality characteristics section on pages 2-64 to 2-69.

The physical components of runoff water from pipeline construction across streams is discussed on page 3-67. The general feeling conveyed in the B. L. M. document is that sedimentation and siltation will take place for about one month after the construction and then the streams will return to normal.[1] Damage could be caused to fish due to siltation, but probably won't be, according to the B. L. M. study on page 3-78. The B. L. M. suggests on page 4-3 of their study, that flow be diverted around pipeline-stream crossings during pipeline construction to minimize sedimentation. Timing construction activities to protect spawning fish is also mentioned, in the B. L. M. document on page 4-2, as a mitigating measure. In general, the subject of siltation during pipeline construction across watercourses is well covered by the B. L. M., however, the specific impact of construction in the Sprague Lake drainage is not mentioned.

⑦ C - 4a. PROBLEM STATEMENT: Due to the close proximity of the proposed pipeline route to the town of Sprague, dust will be a problem. (Vol II, Application for Site Certification, p. 6-100).

REVIEW COMMENTS: A wind erosion map provided by the B. L. M. on pages 86-87 of the B. L. M. Map Addendum shows a significant amount of wind erosion should not occur in the Sprague area. On page 128 of the Map Addendum, the wind erosion potential is shown as medium in the Sprague area. Watering and mulching disturbed soils are mentioned as mitigating factors on page 4-2 of the B. L. M. Environmental Statement. The pipeline company is committed to dust control measures in populated areas. The reviewer found no indication by the pipeline company or the B. L. M. of whether Sprague is considered populated enough for the implementation of dust control measures during pipeline construction.

1. B. L. M. Environmental Statement, p. 3-67, 3-72, to 3-78.

⑧ C - 4b. PROBLEM STATEMENT: The safety of children and adults near the pipeline construction right-of-way will be endangered by construction activities.

REVIEW COMMENTS: No specific statements about safety during construction, near the pipeline right-of-way, was found in the B. L. M. Environmental Statement by this review.

C - 4c. PROBLEM STATEMENT: Excessive noise will be a problem in the Sprague area due to the close proximity of Sprague to the proposed pipeline route and due to the location of the pipe stockpile site in Sprague. (Vol. III, part II, Application for Site Certification, page 5-39, 5-40). (Vol. V, Part I, Application for Site Certification, pages A-6-7 to A-7-1).

CONT

REVIEW COMMENTS: In the B. L. M. Environmental Statements on pages 2-49 and 2-50, discussions of noise receptors along the pipeline route are discussed. Sprague is included in this list of noise receptors. The distance from Sprague to the pipeline centerline is expected to be 1,000'. It is noted on page 2-49 of the B. L. M. document that Washington State has laws regarding excessive noise at night. Pipeline construction will be limited to daytime as mentioned on page 3-58 of the B.L.M. study. The table on page 3-59 states that the maximum noise level for Sprague will be 62 decibles, and 55 decibles for a length of four days. Except for the fact that a layman has no idea how loud 62 decibles is, from the B. L. M. data, noise level information is covered quite well for the Sprague area.

⑨ C - 4d. PROBLEM STATEMENT: The City of Sprague is inside of the Northern Tier Pipeline Company's two-mile wide pipeline corridor; legally, if Lincoln County accepts this corridor, the pipeline could be placed inside the City of Sprague; pipeline construction and operation inconveniences will be felt by the people of Sprague, if this happens. (Vol. IV, App. for Site Certification P.806509)

REVIEW COMMENTS: This problem is not mentioned in the B. L. M. document.

C - 5f. PROBLEM STATEMENT: This area is characterized by a high perched water table; undetected pipeline leak in this area will pollute the perched water table and transport oil through the perched aquafer, and possibly into a groundwater recharge area, polluting the deeper water table. (Vol. IV, Application for Site Certification, p. 806343-806344).

⑩ REVIEW COMMENTS: The B. L. M. Environmental Statement, on page 2-69, mentions the probable existence of a shallow perched water table between pipeline miles 340 and 435. This shallow water table, in the reviewer's opinion, does exist, especially from Sprague east in Lincoln County. According to the B. L. M. draft, on page 3-67, especially critical areas for oil spills are high water table regions and groundwater recharge areas. In review of the B. L. M. document, nothing was mentioned about where any ground water recharge areas in Lincoln County are located. Nevertheless, the B. L. M. document does warn us of the dangers of an oil spill into a shallow water table.

D - 1a. PROBLEM STATEMENT: Future County development will be hindered by placing the pipeline in an area where the pipeline would conflict with local land use decisions.

⑪ REVIEW COMMENTS: Land use and comprehensive plan studies are generally already mitigated through local land use hearings. Local shoreline management ordinances, and conformance of local proposed pipeline construction plans to local ordinances, are not covered in the B. L. M. document.[1]

D - 1b. PROBLEM STATEMENT: Crude oil is forecast to be a primary energy source for the U. S. through 1990's. If the pipeline is only to be used for a short time, losses in county goods and services will outweigh benefits (Vol. II, Application for Site Certification, p. 6-205).

REVIEW COMMENTS: Alternative proposals for crude oil transportation are described in the B. L. M. document.

⑫ Alternative energy sources, which might eliminate or lessen the need for a petroleum pipeline in future years are also apparently not mentioned in the B. L. M. study.

⑬ D - 2a. PROBLEM STATEMENT: When conflicts arise with the pipeline company, it may be uneconomical for agencies or individuals to recover damages due them because of the substantial legal resources of the pipeline company.

REVIEW COMMENTS: The use of a mediating board or other third party legal processes to resolve conflicts between counties and the pipeline company was apparently not discussed in the B. L. M. Environmental Statement. In the reviewer's opinion, the problem of legal processes is a very real concern when dealing with an agency as large as a pipeline company.

D - 2b. PROBLEM STATEMENT: The "Oil Spill Contingency Plan" has not been made public. This leaves the agencies and individuals of our county uninformed about how oil spills will be cleaned up and who will pay for their cleanup. (Vol. II; Application for Site Certification, p. 6-1-134) (Vol. III, Part II, Application for Site Certification, p. 5-31).

⑭ REVIEW COMMENTS: The B. L. M. document quite extensively discusses the Oil Spill Contingency Plan and the elements it will contain when it is released.[1] It did not say exactly when the Oil Spill Contingency Plan would be brought out, nor how much control Lincoln County would have in revising the Contingency Plan if it is not adequately protective of county property.

PROBLEM STATEMENT:
D - 3a. Some Lincoln County roads will be unable to stand the stresses of heavy equipment transportation needed in pipeline construction.

D - 3b. PROBLEM STATEMENT: If the backfill is improperly replaced on public and private road crossings, damage will occur with use by car, truck and heavy equipment. Improper construction practices could result in undue tension being placed on the pipeline, with a possibility of fracture.

D - 3c. PROBLEM STATEMENT: Future changes of grade on county roads will be more restrictive if the pipeline is placed at a minimum depth under county roads.

D - 3o. PROBLEM STATEMENT: Construction in Adams County will undoubtedly require the use of some Lincoln County access roads, especially in the 18-20 month construction period for pump station number eight. (Vol. II, Application for Site Certification, p. 6-107).

⑮ REVIEW COMMENTS: Very little was mentioned by the B. L. M. about sharing responsibility on road maintenance costs or services. The Forest Service statements on page 4-7 in the B. L. M. document mentioned the need for maintenance standards and responsibility during pipeline construction and operation.

This review located nothing in the B.L. M. Environmental Statement about the problem of future road grade changes and their restriction by pipeline placement.

1. B. L. M. Environmental Statement, [illegible]

82 CONT

⑮ An improperly rebuilt roadbed (public or private) over the pipeline could place undue tension on the pipeline. This factor was apparently not mentioned in the B. L. M. document.

The B. L. M. document did discuss road use damage or delay during pipeline construction or spill cleanup.[1]

Alternatives such as load limit restrictions, placement of shield pipes, extra pipeline depth, and improved roadbed construction were evidently not specifically dealt with in the B. L. M. statement.

D - 3d. PROBLEM STATEMENT: Land leveling or deep ripping to break up hardpan would damage the pipeline if farmers work the soil deeper than the proposed minimum pipeline depth of 36". (Vol. I, Application for Site Certification, pages 2-14).

REVIEW COMMENTS: In the B. L. M. Environmental Statement on page 3-105, it states that a burial depth of 3' will be restrictive to certain agricultural activities. Included in the list of restricted agricultural activities is land leveling, irrigation ditch construction, and border type irrigation. The document cites the proposed East High Canal System as an example of a potentially affected area.

D - 3e. PROBLEM STATEMENT: Lincoln County government and citizens will need to provide extra services such as housing, law enforcement, health, fire protection; school space and other services during pipeline construction.[2] Probable short term increases in population for cities along the pipeline route include: 16.5% for Ritzville, 7.9% for Lind, and 5.3% for Othello.[3]

G - 3f. PROBLEM STATEMENT: The major portion of pipeline construction will take place from April through November 1980; this will have an adverse effect on agricultural activities; especially on wheat harvest. (Vol. II; Application for Site Certification, p. 6-105).

1. B. L. M. Environmental Statement, p. 2-141
2. B. L. M. Environmental Statement, p. 4-8
3. B. L. M. Environmental Statement, p. 5-20

⑯ REVIEW COMMENTS: Traffic delays to adjoining land uses are mentioned as an impact of pipeline construction or spill cleanup. [1] In the reviewer's search, nothing was found in the B. L. M. document specifically about possible holdup of agricultural activities due to road blockage during pipeline construction It is very important that detours be used to keep roads open during pipeline construction activities, so that harvest will not be delayed.

D - 3g. PROBLEM STATEMENT: The pipeline company has not shown where material sites, for rock-free fill material or waste dump sites, will be located. Improper location of such sites will be unsightly and perhaps erosive. (Vol. III, part II; Application for Site Certification, p. 5-17).

REVIEW COMMENTS: The B. L. M. Environmental Statement mentions general areas of location and reclamation of borrow sites.[2]

D - 3h. PROBLEM STATEMENT: The Northern Tier Pipeline Company was not specific at what maximum pipeline slope they would begin placing erosion control devices or materials to help control erosion in the pipeline trench, should a large runoff period occur.

⑰ REVIEW COMMENTS: Detail discussion of erosion amounts per acres was given in the B. L. M. document as well as other related erosion problems. No specific discussion on placement of pipeline trench erosion control devices was found in the B. L. M. document by this review.

G - 3i. PROBLEM STATEMENT: No statements about dust control in rural areas were made by the pipeline company; dust (wind erosion) removes a large amount of farmable topsoil from the land.

REVIEW COMMENTS: A wind erosion map provided by the B. L. M. on pages 84-87 of the B. L. M. Map Addendum shows a significant amount of wind erosion could occur in parts of Lincoln County. Wind erosion in lbs./acre is covered on pages 3-63 and 3-64 of the B. L. M. Environmental Statement in Lincoln County. Watering and mulching disturbed soil are mentioned at mitigating factors on page 4-2 of the B. L. M. Environmental Statement.

1. B. L. M. Environmental Statement, p. 2-141
2. B. L. M. Environmental Statement, p. 4-2

D - 3j. PROBLEM STATEMENT: Many of the wheatland, loessial soils, through which the pipeline will pass, are subject to erosion during severe runoff periods. Gullies or slumps will expose the pipeline during times of severe erosion, especially right after construction when the fresh pipeline backfill has not yet compacted. (Vol. III, part II; Application for Site Certification, pages 5-24.

REVIEW COMMENTS: The erosive character of the loessial soils in Lincoln County is brought to our attention in the B. L. M. Map Addendum on pages 84-87. On page 4-2 of the B. L. M. Environmental Statement, a measure which would have the pipeline avoid areas of high potential for mass failure is proposed by the U. S. Forest Service. The B. L. M. document shows two areas along the pipeline route in Lincoln County where slope instability or mass failure potential will be a problem.[1] The two areas shown in the B. L. M. study where slope instability is a problem correspond to Bagdad and Anders-Benge-Rock Outcrops Association soil types. In the reviewer's opinion, pipeline construction in these soil types should avoid steep slopes.

⑱ Another soil problem which exists in Lincoln County that has not yet been brought to attention, is the low cohesive strength of the Ritzville soil types through which the pipeline will pass. According to Adams County, U. S. D. A Soil Conservation Service, Soil Survey, Engineering Interpretations, published after 1970, slope cave-in danger is critical on these soils when excavated or trenched. Since the minimum depth of the proposed Northern Tier Pipeline trench is 78", safety hazards to workers in the pipeline trench are to be expected. The Soil Conservation Service information recommends sloping the sides of trenches in these Ritzville soil types, and any soil type which lacks cohesive strength, as a safety measure to workers in the trench.

CONT

D - 3k. PROBLEM STATEMENT: The safety of children and adults near the pipeline construction right-of-way will be endangered by construction activities.

⑲ REVIEW COMMENTS: No specific statements about safety during construction, near the pipeline right-of-way, were found in the B. L. M. study, by this review.

D - 3m. PROBLEM STATEMENT: Sabotage is possible on the pipeline if it is placed above the ground at canal or stream crossings. (Vol. II; Application for Site Certification, p. 6-60).

⑲A REVIEW COMMENTS: The possibility of sabotage at an overhead pipeline-canal crossing is mentioned on page 3-106 in the B. L. M. Environmental Statement. Mitigating measures dealing with this problem were not found in the B. L. M. document, by this review.

D - 3n. PROBLEM STATEMENT: Utilities services will be cut off to local residents if the pipeline company accidently severs utility lines during excavation for pipeline construction.

REVIEW COMMENTS: The possibility of damage to utility systems is discussed in the B. L. M. Environmental Statement on page 5-21. An oil spill or oil spill cleanup may cause damage to a nearby utility or transportation system,according to the B. L. M.[1] The B. L. M. states, on page 3-107 of their Environmental Statement, that pipeline construction and pipeline electrical use might interfere with possible expansion of electrical transmission systems.

The fact that close coordination would be maintained between the pipeline company and other utility companies through crossing and joint use permits is mentioned by the B. L. M.[2]

D - 4a. PROBLEM STATEMENT: Ten minutes will be needed to shut the pipeline off and close mainline valves in case of a pipeline break,the volume of oil spilled in this period of time would be enormous, in the case of a pipeline rupture. (Vol. II; Application for Site Certification, p. 6-102).

D - 4b. PROBLEM STATEMENT: Based on data from existing oil pipeline, oil spills of an average volum of 2,747 barrels per spill can be expected once every 21 years in Lincoln County; one such spill would damage a large area of land. (Vol. I; Application for Site Certification, p. 2.11-55 and page 2.11-70).

1. B. L. M. Environmental Statement, p. 5-22 & p. 3-107
2. B. L. M. Environmental Statement, p. 5-21

D - 4c. PROBLEM STATEMENT: With the proposed initial pipeline output of 709,000 b.p.d. the leak detection system will be sensitive to .5% of the pipeline throughout; this would mean a leak of 3,545 b.p.d. could go undetected by the pipeline company's leak detection system. A leak of this size in an uninhabited area would cause a great amount of damage before it was repaired. (Vol. III, part II; Application for Site Certification, p. 2.11-70) (Vol. I, Application for Site Certification, p. 2-14).

REVIEW COMMENTS: The B. L. M. Environmental Statement states that an oil spill rate of .0022 spills/mile/year is to be expected, while the Northern Tier Pipeline Application for Site Certification states than an oil spill rate of .0012 spills/mile/year can be expected.[1] Use of the B. L. M. data will change the calculation in the Lincoln County notebook under D - 4b. from a spill on the average of once every 21 years to a spill once every 11 years in Lincoln County, if the B. L. M. data is correct.

⑳ The reviewer found nothing in the B. L. M. Environmental Statement about the amount of time needed to close mainline valves in case of a spill.

The volume of an undetectable leak is the same in the B. L. M. document as in the Northern Tier Pipeline Application for Site Certification.[2]

E - 1a. PROBLEM STATEMENT: A two-mile wide pipeline corridor has been chosen by the pipeline company. At this time, the pipeline could be positioned at any place within this corridor. Individuals and agencies will find it difficult to plan, not knowing the exact future position of the pipeline within this corridor.

㉑ REVIEW COMMENTS: In review of the B. L. M. Environmental Statement, no discussion of corridor width or pipeline placement within the two-mile wide corridor was found.

1. B. L. M. Environmental Statement, p. 3-105, Vol. III, part II, NTPL Company Application for Site Certification, p. 2.11-65.
2. B. L. M. Environmental Statement, p. 3-65.

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B

ADAMS COUNTY

REVIEW OF DRAFT ENVIRONMENTAL STATEMENT
by the BUREAU OF LAND MANAGEMENT
on the PROPOSED NORTHERN TIER PIPELINE PROJECT

In review of the Bureau of Land Management Environmental Statement, several strong points were revealed. These points are helpful to us in accessing our county's concerns in view of the proposed construction of the Northern Tier Pipeline.

The existance of a waterfowl nesting area at the upper end of Sprague Lake is shown in the B.L.M. document to be significant.[1] Since part of Sprague Lake is in Adams County, this information is of importance to the reviewer in giving us knowledge about how an oil spill could effect waterfowl concentrations in Adams County.

An area in Adams County, along the pipeline route, was shown to have a critical water erosion potential in the B.L.M. document.[2] U.S.D.A. Soil Conservation Service soils data gave us information about the soils in this area; however, it was difficult to intrepret. The B.L.M. study has helped show us the need for extreme erosion control measures in this area.

The general organization of the material in the B.L.M. report was good in that we were able to locate whatever information we needed on the various subjects we studied, among the subjects covered in the B.L.M. report.

In review of the Bureau of Land Management document several weak points were also brought out.

① The report in general was not detailed enough to cover local problems adequately. For example, a map of the pipeline route showing the probability of a pipeline leak mile per mile along the route would have been helpful to the reviewer. The reviewer could better access the adequacy of the proposed placement of mainline through Adams County by the pipeline company with a map like this.

1. Map addendum p. 86 & 87
   Environmental statement p. 2-100

2. Map addendum p. 84 - 87
   Environmental statement p. 3 - 63

The environmental maps in the B.L.M. map addendum in some cases were also not detailed enough to access the characteristics of the entire 2 mile wide pipeline corridor.

② Some of the research done in the B.L.M. document was incomplete. On page 2 - 141 of the Draft Environmental Statement, it states that there are no camper spaces available in Adams County. There are, however, camper spaces available in Adams County; for instance, Bob Lee Campground on Sprague Lake.

③ In some cases, review of the Bureau of Land Management document raised questions. Conflicts of data were found in comparing the B.L.M. document with other sources of information. The main example of this is the conflict in data between the B.L.M. which says ".0022 oil spills/mile/year" are to be expected, and the Northern Tier Company which says ".0012 spills/mile/year" is the expected spill rate along the pipeline route.[1]

1. B.L.M Environmental Statement p. 3 - 105
   Vol. III, part II, NTPL Co. Application for site certification, p. 2.11 - 65

ADEQUACY OF B.L.M. DOCUMENT

in COMPLEMENTING SPECIFIC ADAMS COUNTY PROBLEM STATEMENTS*

A - 1a. PROBLEM STATEMENT: There would be a break in the irrigation schedule, which would damage cropland if the pipeline canal crossing is built during the irrigation season and the East High irrigation canals are in service (Vol. II; Application for Site Certification; p. 6 - 105)

A - 1b. PROBLEM STATEMENT: An oil spill into the proposed East High Canal system would damage hundreds of thousands of acres of cropland downstream in Adams, Grant, Lincoln, and Franklin Counties (U.S.B.R. Columbia Basin Project map; Jan., 1977).

REVIEW COMMENTS: The B.L.M. Environmental Statement made mention of the fact that ground saturated with oil from an oil spill into an irrigation system could take from one to five years to recover, but that cultivation and fertilization would speed this recovery process.[1] Types of crops most susceptible to oil contamination are mentioned, as well as pipeline inconveniences to irrigated land, (leveling, canal construction, etc.) in the B.L.M. document.[2] The B.L.M. made the statement on page 3 - 105, in the Environmental Statement, that 3' may not be a sufficient burial depth for the pipeline in agricultural areas. It was also stated that planning and timing will be needed to lessen pipeline impact on future irrigation projects like the proposed East High project.[3]

1. B.L.M. Environmental Statement p.5 - 21, 3 - 106
2. B.L.M. Environmental Statement p.5 - 21, 3 - 106, 3 - 105
3. B.L.M. Environmental Statement p.1 - 59

*Problem Statements found in Adams County Northern Tier Pipeline Energy Impact Analysis Notebook.

④ The B.L.M. document apparently did not mention how many acres of crops to the south in the proposed East High Canal System would be destroyed if a leak occured into the canal. The B.L.M. evidently did not note any possible ways of lessening the impact of pipeline construction to the canal system, such as construction during a non-agricultural season.

A - 2a. PROBLEM STATEMENT: If an oil spill should occur in Lincoln County, anywhere in area A, the natural slope of the land would drain oil into Adams County and damage cropland (Vol. IV; Application Certification map; p. 806168-806171).

⑤ REVIEW COMMENTS: No supplementary information mentioned in the B.L.M. document on this subject.

A - 3a. PROBLEM STATEMENT: During construction in Lincoln County, and Adams County, roads will be used and possibly damaged, bringing extra maintenance cost to Adams County.

CONT

C - 1a. PROBLEM STATEMENT: Improperly designed pump station access roads will make it more difficult for county services to serve the pipeline pump station.

G - 3a. PROBLEM STATEMENT: Some Adams County roads will be unable to stand the stresses of heavy equipment transportation needed in pipeline construction.

G - 3b. PROBLEM STATEMENT: If the backfill is improperly replaced on public and private road crossings, damage will occur with use by car, truck, and heavy equipment. Improper construction practices could result in undue tension being placed on the pipeline, with a possibility of fracture.

G - 3c. PROBLEM STATEMENT: Future changes of grade on county roads will be more restrictive if the pipeline is placed at a minimum depth under county roads.

⑥ REVIEW COMMENTS: Very little was mentioned by the B.L.M. about sharing responsibility on road maintenance costs or services. The Forest Service statements on page 4 - 7 in the B.L.M. document mentioned the need for maintenance standards and responsibility during pipeline construction and operation.

This review located nothing in the B.L.M. Environmental Statement about the problem of future road grade changes and their restriction by pipeline placement.

An improperly rebuilt roadbed (public or private) over the pipeline could place undue tension on the pipeline. This factor was apparently not mentioned in the B.L.M. document.

The B.L.M. document did discuss road use damage or delay during pipeline construction or spill cleanup.[1]

Alternatives such as load limit restrictions, placement of shield pipes, extra pipeline depth, and improved roadbed construction were evidently not specifically dealt with in the B.L.M. statement.

E - 1a. PROBLEM STATEMENT: In rangeland areas it has been shown that when native grasses are destroyed during construction, inferior grasses such as cheat grass will invade construction areas (Vol. III, Part 1; Application for Site Certification; p. 2. 4 - 29).

REVIEW COMMENTS: In the B.L.M. Environmental Statement on page 4 - 4 the lack of mitigating measures dealing with revegetation is discussed. They suggest reseeding with natural vegetation on page 5 - 16 of the report, which is in line with local desires. Methods of reseeding are discussed in the B.L.M. document also.[1]

⑦ The Pipeline System, Vegetation Impact table on page 3 - 81 of the Environmental Statement is difficult to interpret for our use. Apparently nothing is mentioned in the statement about our area's specific problem of cheatgrass taking over after natural wheatgrass has been destroyed during construction. That rangeland areas could revegetate with undesirable species is mentioned, but in the reviewer's opinion, rangeland almost certainly would revegetate with undesirable species after pipeline construction.[2]

Adams County is not mentioned in the natural vegetation table on pages 3 - 82 and 3 - 83, and it should be.

In general, the rangeland vegetation problem in Adams County is only partially covered in the B.L.M. Environmental Statement.

1. B.L.M. Environmental Statement p. 4 - 4
2. B.L.M. Environmental Statement p. 3 - 104

E - 2a. Some of this area is characterized by soil with a permeable gravel underlay where a small pipeline leak of 2 - 5 gpm would go undetected at the surface of the ground, thereby polluting the environment (Vo. II, Part II; Application for Site Certification; p. 2.11 - 70; and Adams County Soils Survey, map; p. 8).

⑧ REVIEW COMMENTS: Soil types and characteristics are discussed in some detail in the B.L.M. Environmental Statement; permeability is also discussed to some degree.[1] No apparent discussion is made on the subject of oil permeability in soils, however, in the B.L.M. document.

E - 3a. PROBLEM STATEMENT: Open pipeline trench or construction equipment will harm or restrict range animals during pipeline construction.

REVIEW COMMENTS: The B.L.M. Environmental Statement mentions that open pipeline trench and construction equipment operation could cause livestock injuries or fatalities.[2] On page 1 - 44 in the B.L.M. document it states that the pipeline trench will be open for as short a time as possible. ⑨ The reviewer found nothing in the B.L.M. report about skipping sections during construction so range animal movement would not be hindered.

F - 3a. PROBLEM STATEMENT: An insufficient number of block and check valves are currently proposed for the Sprague Lake drainage area, increasing the probable volume of an oil spill in that area (Vol. IV; Application for Site Certification; p. 806170).

REVIEW COMMENTS: The characteristics and location of mainline valves are given in the B.L.M. Environmental Statement on pages 1 - 24 and 1 - 25.

As mentioned earlier, the reviewer would be in favor of a map or list showing areas where the probability of an oil leak or spill would be greater than the pipeline average. With this information, Adams County personnel could plan, with the use of topographic data, where block and check valves should be placed in Adams County.

1. B.L.M. Map Addendum, p. 84 - 87 and p. 127 - 128
   B.L.M. Environmental Statement p. 2 - 54 to 2 - 55
2. B.L.M. Environmental Statement p. 3 - 104

⑩ Department of Transportation regulations regarding the placement of mainline valves are discussed; however, no indication of adequacy in protecting Adams County is given in the B.L.M. document.[1]

G - 1a. PROBLEM STATEMENT: Future county development will be hindered by placing the pipeline in an area where the pipeline would conflict with future land use designs.

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CONT

REVIEW COMMENT: Land use and comprehensive plan studies are generally already mitigated through local land use hearings. No shoreline management areas are crossed in Adams County. Some coverage of these factors are found in the B.L.M. document.[2]

G - 1b. PROBLEM STATEMENT: Crude oil is forecast to be a primary energy source for the U. S. through 1990's. If the pipeline is only to be used for a short time, losses in county goods and services will outweigh benefits (Vol. II, Application for Site Certification, p. 6 - 205).

REVIEW COMMENTS: Alternative proposals for crude oil transportation are described in the B.L.M. document.

⑪ Alternative energy sources, which might eliminate or lessen the need for a petroleum pipeline in future years are also apparently not mentioned in the B.L.M. study.

G - 2a. PROBLEM STATEMENT: When conflicts arise with the pipeline company, it may be uneconomical for agencies or individuals to recover damages due them because of the substantial legal resources of the pipeline company.

⑫ REVIEW COMMENTS: The use of a mediating board or other third party legal processes to resolve conflicts between counties and the pipeline company was apparently not discussed in the B.L.M. Environmental Statement. In the reviewer's opinion, the problem of legal processes is a very real concern when dealing with an agency as large as the pipeline company.

1. B.L.M. Environmental Statement p. 1 - 24 and 1 - 25
2. B.L.M. Environmental Statement pages 3 - 102, 3 - 104 and 1 - 61.

G - 2b. PROBLEM STATEMENT: The "Oil Spill Contingency Plan" has not been made public. This leaves the agencies and individuals of our county uninformed about how oil spills will be cleaned up and who will pay for their cleanup. (Vol. II; Application for Site Certification, p. 6 - 1 - 134) (Vol. III, Part II; Application for Site Certification; p. 5 - 31).

⑬ REVIEW COMMENTS: The B.L.M. document quite extensively discusses the Oil Spill Contingency Plan and the elements it will contain when it is released.[1] It did not say exactly when the Oil Spill Contingency Plan would be brought out, nor how much control Adams County would have in revising the Contingency Plan if it is not adequately protective of County property.

G - 3d. PROBLEM STATEMENT: Land leveling or deep ripping to break up hardpan would damage the pipeline if farmers work the soil deeper than the proposed minimum pipeline depth of 36". (Vol. 1; Application for Site Certification, pages 2 - 14).

REVIEW COMMENTS: In the B.L.M. Environmental Statement on page 3 - 105, it states that a burial depth of 3' will be restrictive to certain agricultural activities. Included in the list of restricted agricultural activities is land leveling, irrigation ditch construction, and border type irrigation. The document cites the proposed East High Canal System as an example of a potentially affected area.

G - 3e. PROBLEM STATEMENT: Adams County government and citizens will need to provide extra services such as housing, law enforcement, health, fire protection; school space and other services during pipeline construction.[2] Probable short term increases in population for cities along the pipeline route include: 16.9% for Ritzville, 7.9% for Lind, and 5.3% for Othello.[3]

1. B.L.M. Environmental Statement p. 1 - 54
2. (Vol. III part II; Application for Site Certification, pages 5 - 53, 5 - 54).
3. (Vol. III part II; Application for Site Certification, pages 2.12 - 63) (Vol. III part I, Application for Site Certification, pages 1.13 - 17).

REVIEW COMMENTS: Current information on housing, rental units, cam per space, medical services, police protection and fire protection, is given in the B.L.M. document.[1] ⑭ At least some of this information is inaccurate, such as the table on page 2 - 141 that states that there is no available camper space in Adams County.

Construction work force impact by month is given by pipeline section on page 3 - 120 of the B.L.M. document. On page 3 - 122 and 3 - 123, very useful information is given on transient population, construction work force, and construction employment by county. The B.L.M. makes note of the fact that the Northern Tier Pipeline Company will provide its own housing where needed.[2]

G - 3f. PROBLEM STATEMENT: The major portion of pipeline construction will take place from April through November 1980; this will have an adverse affect on agricultural activities; especially on wheat harvest. (Vol. II; Application for Site Certification, p. 6 - 105).

⑮ REVIEW COMMENTS: Traffic delays to adjoining land uses are mentioned as an impact of pipeline construction or spill cleanup.[3] In the reviewer's search, nothing was found in the B.L.M. document specifically about possible holdup of agricultural activities due to road blockage during pipeline construction. It is very important that detours be used to keep roads open during pipeline construction activities, so that harvest will not be delayed.

G - 3g. PROBLEM STATEMENT: The pipeline company has not shown where material sites, for rock-free fill material or waste dump sites, will be located. Improper location of such sites will be unsightly and perhaps erosive. (Vol. III part II, Application for Site Certification p. 5 - 27).

REVIEW COMMENTS: The B.L.M. Environmental Statement mentions general areas of location and reclamation of borrow sites.[4]

1. B.L.M. Environmental Statement p. 2 - 141
2. B.L.M. Environmental Statement p. 4 - 8
3. B.L.M. Environmental Statement p. 5 - 20
4. B.L.M. Environmental Statement p. 4 - 2

G - 3i. PROBLEM STATEMENT: No statements about dust control in rural areas were made by the pipeline company; dust (wind erosion) removes a large amount of farmable topsoil from the land.

CONT

REVIEW COMMENTS: A wind erosion map provided by the B.L.M. on pages 84-87 of the B.L.M. Map Addendum shows a significant amount of wind erosion could occur in parts of Adams County. Wind erosion in lbs./acre is covered on pages 3 - 63 and 3 - 64 of the B.L.M. Environmental Statement in Adams County. Watering and mulching disturbed soil are mentioned as mitigating factors on page 4 - 2 of the B. L. M. Environmental Statement.

G - 3j. PROBLEM STATEMENT: Many of the wheatland, loessial soils, through which the pipeline will pass, are subject to erosion during severe runoff periods. Gullies or slumps will expose the pipeline during times of severe erosion, especially right after construction when the fresh pipeline backfill has not yet compacted. (Vol. III, part II; Application for Site Certification, pages 5 - 24).

REVIEW COMMENTS: The erosive character of the loessial soils in Adams County is brought to our attention in the B.L.M. Map Addendum on pages 84 - 87. On page 4 - 2 of the B.L.M. Environmental Statement, a measure which would have the pipeline avoid areas of high potential for mass failure is proposed by the U. S. Forest Service. The B.L.M. document is accurate in that it shows little or no potential for mass failure in Adams County.

⑯ One soil problem which exists in Adams County that has not yet been brought to attention is the low cohesive strength of the Ritzville soil types through which the pipeline will pass. According to Adams County USDA S.C.S. Soil Survey Engineering Interpretations, published after 1970, slope cave-in danger is critical on these soils when excavated or trenched. Since the depth of the proposed Northern Tier Pipeline trench is at least 78", safety hazards to workers in the trench are to be expected. The Soil Conservation Service information recommends sloping the sides of the trenches in these Ritzville soil types, and any soil which lacks cohesive strength, as a safety measure.

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⑱ REVIEW COMMENTS: The possibility of sabotage at an overhead pipeline-canal crossing is mentioned on page 3 - 106 in the B.L.M. Environmental Statement. Mitigating measures dealing with this problem were not found in the B.L.M. document by the reviewer.

G - 3n. PROBLEM STATEMENT: Utilities services will be cut off to local residents if the pipeline company accidently severs utility lines during excavation for pipeline construction.

REVIEW COMMENTS: The possibility of damage to utility systems is discussed in the B.L.M. Environmental Statement on page 5 - 21. An oil spill or oil spill cleanup may cause damage to a nearby utility or transportation system, according to the B.L.M.[1] The B.L.M. states, on page 3 - 107 of their Environmental Statement, that pipeline construction and pipeline electrical use might interfere with possible expansion of electrical transmission systems.

The fact that close coordination would be maintained between the pipeline company and the other utility companies through crossing and joint use permits is mentioned by the B.L.M.[2]

G - 4a. PROBLEM STATEMENT: Ten minutes will be needed to shut the pipeline off and close mainline valves in case of a pipeline break; the volume of oil spilled in this period of time would be enormous, in the event of a pipeline rupture. (Vol. II; Application for Site Certification, p. 6 - 102).

1. B.L.M. Environmental Statement, p. 5 - 22, p. 3 -107
2. B.L.M. Environmental Statement, p. 5 - 21

G - 4b. PROBLEM STATEMENT: Based on data from existing oil pipeline, oil spills of an average volume of 2,747 barrels per spill can be expected once ever 54 years in Adams County; one such spill would damage a large area of land. (Vol. I; Application for Site Certification, pages 2 - 55 and 2.11 - 65). (Vol. III, part II, Application for Site Certification, page 2.11 - 70).

G - 4c. PROBLEM STATEMENT: With the proposed initial pipeline output of 709,000 b.p.d., the leak detection system will be sensitive to .5% of the pipeline throughout; this would mean a leak of 3,545 b.p.d. could go undetected by the pipeline company's leak detection system. A leak of this size in an uninhabited area would cause a great amount of damage before it was repaired. (Vol. I, Application for Site Certification, p. 2 - 14), (Vol. III - part II, Application for Site Certification, p. 2.11 - 70).

⑲ REVIEW COMMENTS: The B.L.M. Environmental Statement states that an oil spill rate of .0022 spills/mile/year is to be expected, while the Northern Tier Pipeline Application for Site Certification states than an oil spill rate of .0012 spills/mile/year can be expected.[1] Use of the B.L.M. data will change the calculations in the Adams County notebook under G - 4b. from a spill on the average of once every 54 years to a spill once every 28 years in Adams County, if the B.L.M. spill rate is correct.

The reviewer found nothing in the B.L.M. Environmental Statement about the amount of time needed to close mainline valves in case of a spill.

The volume of an undetectable leak is the same in the B.L.M. document as in the Northern Tier Pipeline Application for Site Certification.[2]

1. B.L.M. Environmental Statement p. 3 - 105, Vol. III, part II, NTPL Company Application for Site Certification, p. 2.11 - 65.
2. B.L.M. Environmental Statement p. 3 - 65

H - 1a. PROBLEM STATEMENT: A two-mile wide pipeline corridor has been chosen by the pipeline company. At this time, the pipeline could be positioned at any place within this corridor. Individuals and agencies will find it difficult to plan, not knowing the exact future position of the pipeline within this corridor.

⑳ REVIEW COMMENTS: In review of the B.L.M. Environmental Statement, no discussion of corridor width or pipeline placement within the two-mile wide corridor was found.

G - 3h. PROBLEM STATEMENT: The Northern Tier Pipeline Company was not specific at what maximum pipeline slope they would begin placing erosion control devices or materials to help control erosion in the pipeline trench, should a large runoff period occur.

㉑ REVIEW COMMENTS: Detail discussion of erosion amounts per acres was given in the B. L. M. document as well as other related erosion problems. No specific discussion on placement of pipeline trench erosion control devices was found in the B. L. M. document by this review.

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State of Montana
Office of The Governor
Helena, 59601

THOMAS L. JUDGE
GOVERNOR

March 27, 1979

Mr. Al Leonard, Project Manager
BLM, Northern Tier Pipeline EIS Team
700 N. E. Multnomah
Suite 1250
Portland, Oregon 97232

Dear Mr. Leonard:

As you know, the Montana Department of Natural Resources and Conservation is currently preparing an environmental impact statement on the proposed Northern Tier Pipeline in Montana. Throughout the process the Department of Natural Resources and Conservation has been working closely with your staff and will continue to do so until completion of both studies.

In light of this cooperation, and the fact that the state's EIS is not yet completed, I do not feel it is necessary or appropriate for the State of Montana to comment on the Federal draft environmental impact statement.

Sincerely,

Thomas L. Judge
THOMAS L. JUDGE
Governor

cc: Lt. Governor Schwinden
Ted Doney
Robert Wambach
Leo Berry
A.C. Knight
Harold Fryslie
Gordon McOmber
Jim Glosser

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84

Northern Tier
Pipeline Co.

MIDLAND NATIONAL BANK BLDG. • SUITE 500
PHONE 406-248-1388 • BILLINGS, MONTANA 59101

March 29, 1979

Bureau of Land Management
Northern Tier Project
Room 1250 - Lloyd Building
700 NE Multnomah
Portland, OR 97232

Gentlemen:

Northern Tier Pipeline Company (NTPC) has conducted a comprehensive review of the Draft Environmental Statement produced by the Bureau of Land Management on our proposed crude oil transportation system. NTPC is pleased that the BLM and other government agencies (federal, state and local) have developed an informative and detailed DES on our proposal. The BLM is to be commended for the timely completion of the DES in light of the magnitude of the undertaking. We appreciate the flexibility shown by the BLM's ES Team in adjusting to the changes in Northern Tier's proposal as we have responded to valid environmental concerns identified during the environmental review process. We think that this is a direct manifestation of the intent of the National Environmental Policy Act. The most important thing to say about the DES and the ES processes, as carried out by the BLM, is that it has and is continuing to work as intended. NTPC has and will continue to work closely with the BLM to provide pertinent engineering and environmental data to insure the best statement possible and to incorporate mitigation measures which respond to valid environmental concerns.

The attached communication from Environmental Research and Technology, Inc. to NTPC constitutes the substantiative technical comments by Northern Tier Pipeline Company on the DES. It is to be considered as a statement of NTPC for this purpose, and we request that the comments be considered in the development of the Final ES.

It is the intent of NTPC to construct and operate this vital transportation system which will provide an assured supply of petroleum products to agriculture, business, industry and each consumer in the Northern Tier and inland states. We appreciate the participation of the BLM in the review and development of this proposal.

Bureau of Land Management
March 29, 1979
Page 2

Please let me know if you have questions on our comments on the DES.

Very truly yours,

T C Kryzer
T. C. Kryzer, President

TCK/jcs

Attachment

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ERT
ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

MEMORANDUM

TO: T. C. Kryzer
MEMO NO.: BMT-77
FROM: Max C. Deibert
DOC. NO.:
DATE: 29 March 1979
SUBJECT: Detailed Review Comments on the BLM Draft Environmental Statement. Crude Oil Transportation System As Prepared By NTPC.

INTRODUCTION

As authorized by you, the Bureau of Land Management (BLM) Draft Environmental Statement (DES) on the proposed Northern Tier Pipeline Company (NTPC) crude oil transportation system (dated 3 January 1979) has been reviewed and comments have been prepared for submission to BLM prior to 2 April 1979, the closing date of the public comment period on the DES.

This memo contains both a summary of general comments and a detailed list of specific comments with direct citation to the BLM DES text. The specific comments are organized primarily by environmental discipline, but additional comments are provided for the Executive Summary and for the Project Description and Alternatives chapters.

The outline of the response is as follows:

- INTRODUCTION
- GENERAL COMMENTS
- SPECIFIC COMMENTS:
  - Executive Summary
  - Description of the Proposed Action
  - Climate and Air Quality
  - Noise
  - Topography, Geology and Soils
  - Ecology (including Aquatic and Marine Resources and Terrestrial Vegetation and Wildlife)
  - Oil Spills
  - Cultural Resources
  - Visual and Recreation Resources
  - Land Use
  - Transportation and Utility Networks
  - Social and Economic Conditions
  - Alternatives to the Proposed Action

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Reviewers on behalf of NTPC included personnel from Environmental Research & Technology, Inc. (ERT), Butler Associates and the law firm of Preston, Thorgrimson, Ellis, Holman and Fletcher.

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## GENERAL COMMENTS

In general, the analysis is comprehensive, thorough, and reasonably consistent with data and information generated by NTPC concerning the project. Furthermore, the conclusions reached in the assessment of impacts are reasonably consistent with those reached by NTPC and its consultants. There are, however, several issues for which comment by NTPC is warranted.

1) There is a general need to provide clarification of conclusions reached, methods used in reaching conclusions or conducting analyses, and assumptions made in the analyses. As pointed out in the "specific comments" below, it is not always clear how a conclusion was reached, usually because not enough description was given of the assumptions and analysis methods to allow the reader to confirm the conclusion on the basis of the given baseline data.
2) Occasionally there is an inconsistency between basic project data used by BLM in the DES and that generated and/or provided by NTPC. This includes schedule information as well as quantitative data. Likewise, there is occasionally an inconsistency between data used for the same purpose in different parts of the DES. On this issue, the acreage of the Green Point site deserves special mention. The NTPC has title to only 242 acres. Because of a "reverse option," NTPC could be required at a future date to acquire an additional 52 acres, bringing the total to 294 acres. Thus, the Green Point site is referred to as having 242 acres. Other examples are noted under the "specific comments."
3) There are occasional inconsistencies between the impact conclusions reached in the DES and those reached by NTPC as documented in its Application for Site Certification, submitted to the Washington Energy Facility Site Evaluation Council (the NTPC EFSEC Application) dated 18 August 1978. In some cases, we believe that the DES overstates the degree of impact because of extreme conservatism (that is, use of unrealistic worst-case conditions). In other cases, we believe there may have been a computational error. As noted in Item 1, however, it is often not possible to follow through the procedure used to arrive at the impact conclusion.
4) The BLM DES does not provide a complete listing of the mitigation measures that have been committed to by NTPC and that are documented in the NTPC EFSEC Application. Moreover, while some of the NTPC mitigation measures have been incorporated into the BLM analysis of project impacts, others have not and are listed separately in Chapter 4. A consistent treatment of committed NTPC mitigation measures is recommended.
5) It is also recommended that the BLM provide additional details on the provisions of the Public Utility Regulatory Policies Act of 1978, Title V, Crude Oil Transportation Systems, specifically to describe what effect the Act will have on environmental studies, project schedules, consideration of other proposals, and the like.
6) In response to impacts identified by NTPC (for example, in the NTPC EFSEC Application) and to concerns expressed by agencies and the public, NTPC has been studying the feasibility of various "potential mitigation measures" described in the NTPC EFSEC Application, as well as additional pipeline route alternatives, and is currently in the process of making changes that will incorporate several of these mitigation measures. Among these are changes to the submarine pipeline approach at Green Point to avoid the cut in the bluff and changes in the method of bunkering to avoid the use of a large number of small bunker supply barges in Puget Sound. While these measures will largely reduce the corresponding impacts described in the BLM DES, the NTPC review comments focus solely on the proposed action as described and studied in the DES.

All of these issues are addressed below in more detail with reference to specific portions of the BLM DES text.

Executive Summary

① In general, the comments made in the following sections concerning the body of the DES also pertain to the Executive Summary, and corrections made to the DES should be reflected in the Executive Summary. A majority of comments relate to the accuracy of the project description. For example, the entire description must include facts and figures on the Jackass Ridge and Nine Mile Creek/Missoula-to-Helmville primary route. Other specific comments follow.

| Page, Column, Paragraph | Comment |
|---|---|
| 1, C1, P1 | The total mileage should be 1,560 instead of 1,557. |
| 2, C1, P3 | The 20% of refinery capacity numbers for 215,400 barrels per day (bpd) in 1990 and 214,300 bpd in 2000 do not appear to be consistent. |
| 2 and 3 | Dates of various activities need to be revised and mention made of provisions of Title V, Public Utility Regulatory Policies Act. |
| 5 | Route I on Figure 1 should be labeled. Figure 1 also shows an airport at the eastern end of Ediz Hook. Contact with the USCG indicates that there are presently no fixed-wing aircraft operations (nor have there been any during the last several years) and only limited helicopter operations. It would be more accurate to refer to the area as USCG facilities. |
| 10 and 11 | The map for Nine Mile Creek/Missoula-to-Helmville should be revised. |
| 12, C1, P5 | The NTPC has title to only 242 acres at Green Point. |
| 21, C1, P4 | The assumptions concerning sulfur content of bunkering fuel used in the analysis should be stated. The information presented in this paragraph is confusing and appears to be inconsistent with data from Table 3.1.2.7 (page 3-4 of DES). (See also Air Quality comments concerning page 2-4, C1, P4.) |
| 28 and 29 | The retouched photograph of the proposed excavation in the Green Point bluff appears somewhat exaggerated at the top of the bluff, and the superimposed tanks appear somewhat elevated above the ground surface. The NTPC analysis indicates the primary viewing points, north of Green Point in the strait, will be from boats at sea level. Therefore, the retouched photograph is somewhat misleading in portraying an aerial oblique view offshore of the bluff excavation and storage tanks. |
| 29, C2, P1 | The statement that: "During operation of the onshore storage facilities there would be substantial impact on visual or aesthetic values" is misleading. The NTPC analysis indicates that the views of the site from offsite are restricted (see Figure III-1.10-1 in the NTPC EFSEC Application) and that, consequently, the overall aesthetic impact of the onshore storage site (excepting the bluff excavation) is somewhat less than that indicated in the BLM DES. |
| 30, C1, P2 | Although local utility companies are certainly concerned, the statement that "the demand for power would be a substantial impact on existing and future electrical facilities and supply," is misleading regarding power requirements of proposed NTPC facilities in Clallam County. An analysis of this issue prepared for NTPC suggests that NTPC-related power demands would not adversely affect the cost nor the availability of power in Clallam County for two reasons: (1) the nature of the regional power pool (the "one short, all short" arrangement for pooling of resources) and (2) the NTPC-related power demands represent a small proportion of total regional load growth. |
| 33, C1, P3 | The mitigating measures mentioned in paragraph 3, such as to construct during low flows and to avoid spawning season, have been committed to by NTPC. |
| 33, C2, P3 | The discussion of the Flathead Reservation should be omitted since it is no longer on the primary route. |
| 35, C1, P1 | Water withdrawal and discharge mitigation measures have been committed to by NTPC. |
| 37 | Columns 1 and 2 appear to be in reverse order. |
| 41 | The statement that 294 acres are cleared at Green Point is incorrect; only about 140 acres on the 242-acre site are to be cleared. The NTPC does not have title to the remaining (294 less 242) 52 acres. |
| 50, C2, P2 | See the comment made for page B-4 of DES regarding circling of Cedar River watershed by Stampede Pass alternative route. |
| 52 | The descriptions should be changed to address new primary routes. |
| 56 | Figure 14 - Seadock should be the "LOOP" project. |
| 57 and 62 | Description of Trans-Mountain Pipeline, Kitimat Pipeline, and Foothills Pipeline proposals should be revised to include a description of their Title V applications. |
| 63, C1, P4 | See the comment made for page B-4 of the DES Alternatives chapter regarding the capability of the Mid-Continent Pipeline System to be expanded by 875,000 bpd. It should be noted that Northern Tier states west of Minnesota cannot be supplied by the Mid-Continent Pipeline System. |

Description of the Proposed Action

② The following comments relate primarily to Chapter 1 of the DES but also include corrections relating to the project description occurring elsewhere in the DES, including the Map Addendum.

| Page, Column, Paragraph | Comment |
|---|---|
| Chapter 1 | The entire description must include facts and figures for the Jackass Ridge and Nine Mile Creek/Missoula-to-Helmville alternative. The new pipe length is 1,560 miles, and the following tables will be revised by Butler Associates on behalf of NTPC. The changes are minor and therefore only have a minor impact on the overall plans.<br>Table 1.4-3, page 1-16, Federal Lands<br>Table 1.4-4, page 1-17, Pipeline Mileage<br>page 1-18, Description of Jackass Ridge and Nine Mile Creek<br>Table 1.4-5, page 1-19, Pipe Tonnage<br>Table 1.4-6, pages 1-19, 20, and 21, Major Highway/Railroad Crossings<br>Table 1.4-7, page 1-21, Major Stream and River Crossings<br>Table 1.4-8, page 1-22, Minor Crossings<br>Table 1.4-9, page 1-23, Irrigation Canal Crossings<br>Table 1.4-10, page 1-23, Unaffiliated Pipeline Crossings<br>Table 1.4-11, page 1-24, Utility Corridors<br>Table 1.4-12, page 1-25, Location of Valves<br>Table 1.4-13, page 1-27, Location of Pump Stations<br>Table 1.4-14, page 1-31, Pump Station Horsepower<br>Table 1.4-15, page 1-32, Pump station Power Requirements<br>Table 1.4-16, page 1-38, Construction Stockpile<br>Table 1.4-17, page 1-39, Construction Material<br>Table 1.4-19, page 1-42, Pipeline Section Parameters<br>Table 1.4-22, page 1-51, Summary of Cost Pipeline<br>Table 1.4-23, page 1-51, Summary of Cost Unloading Facilities<br>Table 1.4-24, page 1-52, Summary of Cost Onshore Storage<br>Table 1.4-26, page 1-53, Summary of Cost All Facilities<br>Table 1.5-1, page 1-61, Planning and Zoning |
| 1-56, C1, P3 | This paragraph should read: "As soon as the dispatcher had shut down the pipeline system and closed the appropriate, remotely controlled block valves, the appropriate response personnel in the Spill Contingency Plan would be notified." |
| 1-56, C1, P5 | This paragraph should read: "One or more employees would go to the site to confirm and pinpoint the rupture, initiate the appropriate plan to protect the public, and begin containment." |
| 1-58 | Item 22 should read: "Stream flow control measures such as river training works or channelization will be avoided in all areas of pipeline crossings.<br>"Anticipated effectiveness: The current or natural flow character of the streams and rivers will be undisturbed by the pipeline." |
| 1-58 | Add a new Item 29 to read: "Northern Tier Pipeline Company will install a remote means of actuation at all mainline block valves.<br>"Anticipated effectiveness: This will ensure that during an emergency, sections of the pipeline could be isolated by closing the block valves to [illegible] and minimize potential drainage." |
| 1-58 | Add a new Item 30 to read: "Major stream crossings by the pipeline will be constructed during a three-month period designated by the appropriate state agency responsible for the protection of fish and wildlife.<br>"Anticipated effectiveness: This action will minimize impact on fish and wildlife during construction." |
| 1-61 and 1-62 | Description of the Trans-Mountain Pipeline and Kitimat Pipeline proposals should be revised to include a description of their Title V applications. A description of the Foothills Pipeline proposal should be added. |
| 2-26, C1, P2 | Note that NTPC has title to only 242 acres (not 294 acres) for the onshore storage site. |
| 2-45 | Should the picture caption be Port Angeles rather than Port Orchard? |
| 2-57, C1, P1 | Item 4 should be pipeline mile 1,560 rather than pipeline mile 1,565. |
| 2-117 | The segment 11 heading should change 1,565 to 1,560 miles. |
| 3-7, C1, P1 | It is our opinion that these crude oil storage temperatures are higher than will be experienced, especially for foreign crudes. |
| 3-11, C1, P5 and 3-14, C2, P7 | It is unlikely that on abandonment the topography of the onshore storage facilities site would be fully returned to its original condition. |
| 3-58, C1, P4 | Grading and leveling would alter a maximum of 4 to 7 acres for each pump station. |
| 3-87, C1, P2 | The NTPC will not install new microwave transmission facilities. The NTPC proposes to use a leased-line system for control and communications to pump stations and remote block valve sites. This leased-line system may incorporate microwave links but it is not anticipated that new microwave facilities would be required. |
| 5-3, C2, P1, and 5-4, C2, P8, and 6-2, C1, P6 | Green Point acres should be changed from 294 to 242. |
| Map Addendum | The following maps must be revised for the Jackass Ridge, Nine Mile Creek/Missoula-to-Helmville route:<br>Pages 3 through 23<br>Pages 67, 89, 90, 91, 92, 93, 94, and 95 |
| Map Addendum pg. 77 | The BLM map shows the pipeline following the transmission right-of-way northwest and west of the town of Eldon. The NTPC maps show the pipeline leaving the transmission right-of-way northwest of the town and continuing southerly. |
| Map Addendum pg. 77 | The BLM maps shows pump station 2 south of Isabella Lake. The NTPC maps show pump station 2 approximately 1 mile north of Isabella Lake. |
| Map Addendum pg. 77 | The BLM map shows pipeline following the transmission right-of-way south of Isabella Lake. The NTPC maps show pipeline leaving the transmission right-of-way at Isabella Lake and paralleling the Northwest Pipeline right-of-way. |

Climate and Air Quality

③ Overall, the major issues have been addressed and the results have been presented in an objective manner. However, to improve the analysis, it is suggested that some idea be given on the uncertainty in the model calculations when one is comparing the results with Ambient Air Quality Standards (AAQS) or Prevention of Significant Deterioration (PSD) increments. Also, it is noted that throughout the report a comparison is made between nitrogen oxide ($NO_x$) concentrations and the AAQS for nitrogen dioxide ($NO_2$). Nitrogen oxides are composed of nitric oxide (NO) and $NO_2$. There is no AAQS for NO. Therefore, it is meaningless to compare $NO_x$ air quality with an AAQS for $NO_2$. Finally, it is noted that enough information exists regarding present emissions in Port Angeles to allow mathematical modeling of baseline air quality for some pollutants. This would be helpful to evaluate compliance with AAQS without the project. Additional comments include the following.

| Page, Column, Paragraph | Comment |
|---|---|
| ④ 2-3 | Explain that the hydrocarbon (HC) standard is for 6:00 to 9:00 A.M. and is only a guide to limit ozone production. The term HC refers specifically to nonmethane hydrocarbons. |
| ⑤ 2-4, C1, P4 and 3-4, C2, P2 | The question of whether the Heart O' the Hills parkway corridor is within the Olympic National Park boundary for PSD purposes is a legal question that has not been resolved. If it is not, then PSD Class I increments do not apply. If it is, then the question of variance from Class I increments does not depend on the shape of the corridor but rather on whether it contains the specific attributes of dramatic vistas, wilderness |

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⑤ character, and other air quality-related values that were intended to be protected by the PSD Class I requirements. Under the circumstances,

| Page, Column, Paragraph | Comment |
|---|---|
| | NTPC believes that it is appropriate to compare sulfur dioxide ($SO_2$) concentrations with both Class I and Class II PSD increments but that it is premature to assert that Class I increments definitely apply. Moreover, the statement that "irregularity of shape does not allow a variance with Class I standards" is meaningless and should be deleted. |
| 2-4 | The heading of Table 2.1.1.2-3 should be "major industrial sources of air pollutant emissions..." (Note $SO^2$ and $NO^x$ should be $SO_2$ and $NO_x$.) |
| ⑥ 2-33, C2, P4 | The text associated with Table 2.1.2.2-1 states that ozone air quality in the Seattle area has been as high as 0.17 ppm (340 $\mu g/m^3$). In the table, a value of 120 $\mu g/m^3$ is shown for 1975. This discrepancy needs clarification. |
| ⑦ 2-150, C1, P2 | The statement concerning the reduction of pollutant levels in urban areas is too general. While it is generally true that CO and $SO_2$ ambient levels have been decreasing, ozone levels have been increasing generally in the last decade. |
| ⑧ 3-2, C1, P2 | How do the annual average $SO_2$ levels compare with the annual AAQS? |
| ⑨ 3-4, C2, P2 | What is the uncertainty in the model predictions for $SO_2$? This is important in assessing the significance of the estimated frequency of violation of Class I PSD increments for $SO_2$ in Olympic National Park. |
| ⑩ 3-6, C1, P1 | This paragraph confuses the issue of $NO_x$ and $NO_2$. Clarification is needed because of the general comments given above. |
| ⑪ 3-6, C1, P3 | The HC standard is for the 6:00 to 9:00 A.M. 3-hour period. |

| Page, Column, Paragraph | Comment |
|---|---|
| ⑫ 3-7, C1, P1 | Why does API Bulletin 2517 significantly overestimate the emissions? Some background on this is appropriate. |
| ⑬ 3-7, C1, P3 | Nitrogen oxides are composed of NO and $NO_2$. Nitrogen oxides in general do not remove ozone rapidly; only NO does this. The paragraph should make this clear. |

## Noise

Review of those sections of the DES concerning noise indicated no serious omissions or errors.

## Topography, Geology, and Soils

The following changes are recommended to improve the accuracy and clarity of information presented.

The soils information provided is comprehensive and essentially complete but would benefit from a reduction in text through tabulation of numerical data so that a ready comparision of potential impacts would be possible. In addition, the following items require attention.

| Page, Column, Paragraph | Comment |
|---|---|
| ⑭ 3-64, C1, P3 | The sentence: "Severe erosion is a common occurrence on summer fallowed wheatland in this area and is indicative of what would occur following pipeline construction." is not accurate because of the relative scale of large plowed fields in comparison to a narrow pipeline right-of-way. |
| ⑮ 3-65, C1, P7 | An introductory sentence relating hydrostatic testing effects to potential soils impact is needed for clarification of the information presented. |
| ⑯ 5-13, C2, P5 | The statement: "Average soil losses from fugitive dust would be 80 to [illegible] pounds per acre of pipeline right-of-way and would not be mitigated by water application except in urban areas and on U.S. Bureau of Reclamation lands." is in error because the water will provide fugitive dust mitigation wherever it is applied for this purpose. The statement also contradicts statement 4 on page 4-2. |

The geological information provided is sufficient but would benefit from a more objective and less dramatic impact evaluation. In particular, the following items require attention.

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| Page, Column, Paragraph | Comment |
|---|---|
| ⑰ 2-11 | Slope stability at Green Point and Ediz Hook is mishandled in the document, and the erosion rate of the bluff established by Shannon & Wilson (1978) is disregarded. Instability is claimed on pages 2-11, 2-12, 3-11, and 3-12 but a stable condition is stated elsewhere on page 3-12 and Plate III-3 on page 55 of the Map Addendum. Clarification is required, and the clarification should be carried to Tables 5.1.4-1, 5.2.4-1, and Table 6 of the Summary. |
| ⑱ 5-14 | Table 5.2.4-1 and related text indicates that as much as 1,600,000 cubic yards of rock per mile may be excavated. It is very unlikely that any such volume of rock would be excavated, even for long, side-hill traverses in steep terrain where benching would be necessary. Benching in solid rock does not require wide slopes for stability, and it is unlikely that side-hill traverses of 1-mile lengths will be encountered during construction because route selection has specifically avoided such conditions. |
| ⑲ 6-2, C2, P4 | No data or rationalization is presented to support the statement that changes of erosion rates at Green Point will affect sedimentation at Dungeness Spit. While it seems logical that some change could occur, calculations of worst-case conditions indicate that perhaps 350 cubic yards of bluff material could be affected each year (or about 7,000 cubic yards total during a 20-year project lifetime). This volume is not significant in comparison to the millions of cubic yards of material that would be transported longshore during this period of time, and there has been no established erosion-sedimentation tie between Green Point and Dungeness Spit. The statement should be either supported or deleted. |
| ⑳ 2-11 | The Table 2.1.1.4-2 description of level VIII is not consistent with descriptions before and after. |
| 2-12 | Table 2.1.1.4-3 is either mistitled or in error. Richter magnitude does not include an estimate of damage to structures or human response to seismic disturbances. "Intensity" rather than "magnitude" is the appropriate terminology for damage and response conditions. |
| ㉑ 2-52, C1, P2 | Under Sierra-Cascade Province, "Quaternary alluvium and glacial debris" should be identified as unconsolidated deposits rather than "rock strata". |
| ㉒ 2-11, C1, P3 | Map Section VI (map addendum) referred to in this sentence does not exist nor are there any areas indicated on the maps indicating liquefaction as a problem. |
| ㉓ 3-60, C2, P2 | Mileposts given for probable slope movements do not correspond with geological hazards shown in the Map Addendum. |
| ㉔ 4-2, C1, P3 | In Section 4.4 the statement of "no significant measures identified" contradicts the engineering and construction measures identified in pages 1-56 to 1-58 as mitigating procedures. |

References

Shannon & Wilson 1978. Geotechnical Investigation Northern Tier Pipeline Company Marine Terminal Facilities Port Angeles, Washington.

In general, the following should be noted with regard to the Geology/Topography/Soils topics:

1) There are many statements or information made in one part of the report that contradict others in some other part of the report.
2) ㉕ The end result of most environmental analysis carries a flavor of "catastrophy" rather than objective evaluation of conditions that might occur realistically. This is particularly true in terms of Soils, and the discussions of seismicity and related liquefaction potentials.
3) Soils are treated too thoroughly and with too much emphasis in comparison to the other earth-related subjects. The soils discussions are also much too theatrical in terms of the potential effects of construction in comparison to natural or existing conditions. Tabular comparisons of existing vs. projected erosion losses in place of lengthy text would be a very significant improvement in this regard.

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## Ecology (Including Aquatic and Marine Resources, and Terrestrial Vegetation and Wildlife)

The ecology text is generally well organized, presented logically, understandable, and graphically excellent. The descriptive materials are good and generally adequate to assess impacts. The precision of documenting marine resources (i.e., mapping) could be improved and possibly quantified better. The sources for various inventory data, especially data presented in the Map Addendum, are not identified, and the reader cannot double check or search for further clarification without the appropriate citations. An example of this is the mapping of Dungeness Bay as river otter habitat (Map Addendum page 44). Our references indicate that Dungeness Spit and Bay are frequented by harbor seals but not river otter; without a citation we were unable to determine the accuracy of the information.

㉖ The ecology text does have a major weakness, in our opinion, in its treatment of impacts. The magnitude and importance of impacts are not adequately supported by baseline information or by literature concerning potential impacts for a number of topics, including submarine pipeline installation and subsequent turbidity and sedimentation; pipeline installation in terrestrial and freshwater habitats and subsequent erosion and sedimentation impacts; pipeline installation and subsequent disturbance to wildlife; oil spills and subsequent risks to water quality and biota; and abandonment and subsequent impacts on water quality and biota. For example, documentation and explanation of dredging activities that may resuspend heavy trace metals and chlorinated hydrocarbons does not include baseline data to support the presence of such materials in the Port Angeles marine system. The volumes of suspended materials related to dredging are not documented. Similarly, the volumes of eroded materials and sediment created during installation of the pipeline in terrestrial and aquatic habitats are not described in sufficient detail for one to conclude (as is implied in the DES) major nonlocal losses of spawning habitat will occur in almost every stream crossed.

㉗ The sedimentation and erosion impacts predicted do not appear to have considered NTPC-committed (and enforceable) erosion control practices and other pipeline installation techniques (e.g., crossing streams in Washington during the nonspawning and low flow period from mid-June through mid-September).

㉘ It is recommended that documentation of terrestrial habitat losses and disturbance to terrestrial wildlife resulting from pipeline construction be reviewed and clarified. For example, Chapter 2 provides data on bald eagles, which generally occur 1 or more miles from the proposed right-of-way. Chapter 3 provides an impact assessment of bald eagles; statements are made indicating eagles will abandon nests, wintering areas, and feeding habitats because of pipeline construction. Such statements are not supported by baseline data or literature and do not consider the NTPC commitment of environmental inspectors and avoidance of sensitive habitats. In addition, cause and effect relationships between construction activities and critical or significant losses in nest sites for osprey, herons, peregrine falcons, sage grouse, sharptailed grouse, and waterfowl; in elk or deer wintering range; in elk calving habitat; in antelope habitat; in sage grouse dancing grounds; in sharptailed grouse strutting grounds; in grizzly bear habitat; in pheasant habitat; and in fish hatcheries need to be better documented. For example, the interpretation of inventory data in Chapter 2 and in the Map Addendum indicates that many of the areas of concern are not crossed by the right-of-way, are out of the zone of influence (e.g., up-stream), or the species involved have such large home ranges that the area removed is not critical or significant. We believe that the BLM has identified sensitive areas and that the BLM should reevaluate the routing procedures, reclamation procedures, and other mitigation procedures committed to by NTPC that will protect and preserve these sensitive areas. Protective measures not committed to by NTPC should be presented in Chapter 4.

The most important potential impacts of the proposed project could result from oil spills but the impact assessments are not presented in commensurate detail. The discussion could be improved by providing ㉙ information on mode of action, on oil spill probabilities and volumes, and on documentation of water quality or biological impacts. In addition, discussions could be expanded on how oil physically and chemically interacts with water; how oil affects biota physically, physiologically, and behaviorally; and how habitats vary in vulnerability and recovery rates.

Impacts of oil spills are eluded to that are not substantiated, such as ingestion of contaminated prey, magnification of oil through the food chain, and blocking of whale migration. Waterbirds in marine habitats are the most significant group potentially affected but no estimates of potential losses are presented.

㉚ Discussions of oil spill probabilities and volumes do not provide information on the assumptions used to calculate risks and trajectories (for example, the length of time used in the oil spill trajectories for a hypothetical tanker casualty). Submarine pipelines spill probabilities in Table 3.1.7-3 of once in 2.5 years are in conflict with the probability quoted on page 3-25 of once in 161 years.

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㉛ Pipeline spill analyses include analyses that are not feasible, such as oil spills affecting fish hatcheries that do not use the affected waterway as a water source or that are upstream. Another unfeasible impact evaluation was of a waterfowl loss in North Dakota. The analysis concluded that 25,920 waterfowl per year will be lost should an hypothetical oil spill contaminate a 1/8-mile strip on either side of the right-of-way along 225 miles of wetlands. The assumption of a rupture and spillage along a 225-mile length of piepline is unrealistic. Impact analyses generally do not provide documentation to verify feasibility of impact and assume no mitigation.

㉜ Abandonment impact analyses appear to assume that the total pipeline will eventually be removed without regard to economic feasibility or ecological sensitivity of areas. The removal of the pipeline in submarine areas, river crossings, and other sensitive areas will not likely occur.

## Oil Spills

### Oil Spill Risk Analysis

Although the methodology that has been used by the BLM (OIW 1978a, 1978b) differs somewhat from the oil spill risk analysis performed by NTPC in the EFSEC Application, the results of both studies do, in fact, agree quite well (see attached Tables 1, 2, and 3).

Comments here do not address the issue of bunkering fuel risk analysis since NTPC is currently revising bunkering methods to substitute the use of a small number of T-2 class tankers for the previously proposed large number of barges for the supply of bunker fuel. Since the statistics are influenced strongly by the number of vessel calls, the bunker fuel spill risks will be reduced considerably by this forthcoming revision.

The BLM (OIW) risk analysis is generally based on different historical data bases than those used by NTPC: BLM for the most part used the U.S. Coast Guard's Pollution Incident Reporting System (PIRS) files for tanker spills, while NTPC primarily used worldwide tanker fleet casualty and oil spill statistics. Similarly, the BLM used the PIRS and Gulf of Mexico statistics for pipeline spills, while NTPC used the Department of Transportation (DOT) pipeline spill figures. NTPC favors use of worldwide tanker fleet records and DOT data since they are among the most comprehensive data bases currently available.

The BLM's tanker oil spill risk analysis differs from that of NTPC primarily due to lack of accounting and separating relevant spill types and sizes. The BLM has assumed a probabilistic model (spill rates following a normal distribution, for example) based on a small number of statistical but fixed-exposure variables, such as distance per port call. However, this rate, which characterizes the distributions, contains large deviations from the mean depending on the scatter of the data in the U.S. port system under consideration. Consequently, BLM's results contain large variances. The NTPC, on the other hand, has elected to separate operational (small but frequent) spills from the casualty-related (large but infrequent) spills within the framework of a deterministic model. Furthermore, casualty-related spills have been further separated into two parts: the catastrophic accidents involving total loss of a vessel and the more common casualties that can be represented by average spill volumes. The BLM's risk analysis treatment does not readily allow such distinctions. As a consequence, catastrophic spills (i.e., total vessel losses) would not be predicted realistically (i.e., their predicted frequency of occurrence would be extremely small). In spite of these basic differences in risk analysis methodology and in data base, however, Table 1 shows quite reasonable agreement in tanker spill risk and volumes.

With regard to pipeline oil spills, the use of PIRS and Gulf of Mexico records are expected to pose certain problems. U.S. Coast Guard PIRS files include spills that enter into navigable waters and mostly constitute small operational spills. Thus, they may not adequately describe large leaks or ruptures expected from a new and large pipeline system such as NTPS. Gulf of Mexico experience, on the other hand, involves older pipelines in shallow waters and, therefore, is expected to be quite different in terms of oil spill risks than a deeply buried modern pipeline like NTPS. These factors are reflected in the spill risk comparison shown in Table 2.

Finally, Table 3 displays a comparison of NTPS fire and explosion risks. Since the techniques used in these predictions are quite similar to those used by BLM, the results agree quite well (agreement between the detailed results presented in OIW (1978b) are in fact much better).

In addition, comments relating to specific oil spill information in the DES text include the following.

| Page, Column, Paragraph | Comment |
|---|---|
| ㉝ 3-17, C1, P7 | This paragraph references pipeline spill frequencies to North Bend, but Table 3.1.7-3 is titled "Estimated Frequency of Submarine Pipeline Spills for the Proposed Northern Tier Facility at Port Angeles." This is confusing and needs correction. |

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| Page, Column, Paragraph | Comment |
|---|---|
| 3-18, C2, P1 | ㉞ The size of the hypothetical oil spill used for Figures 3.1.7-1 through 3.1.7-6 should be stated. These figures should be preceeded by a spill analysis giving magnitudes as well as frequencies. The placement of the discussion and figures as shown indicates that these results occur each time a spill occurs, regardless of spill size. |
| 3-25, C1, P1 | Estimated oil spill frequency of one spill every 0.0055 years disagrees with Table 3.1.7-3; it presumably should be 0.0055 spills per year (1 in 181 years). |
| 3-28, C2, P1 | The submarine pipelines oil spill frequency should be 0.0054 spills per year, not one spill every 0.0054 years. This disagrees with the 0.0055 probability shown on page 3-25, paragraph 1. |
| 3-79 and 3-85 | The probability of an oil spill occuring in the Quilcene, Dosewallips, Duckabush, Hamma Hamma, or Skokomish Rivers is not given. Also, the probability of a spill of magnitude large enough to do this degree of damage should be given. |

Oil Spill Trajectory Analysis

The physical processes modeled to predict the movement of oil spills are not very different in the BLM (OIW) and NTPC analyses. Both analyses include the effect of wind-induced currents and tidal currents and both grew out of the model developed by the U.S. Coast Guard Oceanographic Unit. ㉟ The biggest difference between the trajectory forecasts appears to be that the BLM forecasts were for a period of five days (page 3-18, C2, P2 states that in Figure 3.1.7-2 Tongue Point would be affected in 60 hours; this time corresponds to about half of the forecast trajectory), while the NTPC forecasts were for no more than 12 hours. If the BLM impact region shown in Figure 3.1.7-3 is reduced by the ratio of forecast times, the results begin to be comparable to those of NTPC.

Several aspects of the BLM trajectory analysis are rather ambiguous, making an accurate comparison of analyses difficult. The following comments refer to statements made on pg. 3-16 of the BLM report. It is stated that oil spill movement is affected by "oceanic pumping" (C1, P6), yet this process is not defined nor referred to again. ㊱ The report states (C2, P1) that the forecast trajectories "do not include the estuarine component," yet several paragraphs later (C2, P7) we find "this model includes...net estuarine flow of about 24 cm/s." This large flow could have an important effect on results. The statement that "oil spill spreading analysis was also incorporated in the model" occurs (C2, P6), yet the very next sentence (C2, P7) states that forecasts were made for "a spill of unspecified size." Since oil spreading is dependent on spill size, these two statements are incompatible. On pg. 3-18 the report argues that, depending on the wind, spills at Port Angeles could endanger either the entire Port Angeles Harbor or the coastline from Port Angeles up to and including Dungeness Spit. This conclusion agrees with NTPC analyses; NTPC added, however, that Dungeness Spit could be affected within 12 hours.

㊲ Without further supporting evidence about the wind and current fields used in BLM model, it is difficult to accept the difference in forecasts shown in Figure 3.1.7-2 and Figure 3.1.7-4 for spills occurring so close to each other. The Port Angeles forecasts shown in Figure 3.1.7-5 and Figure 3.1.7-6 are not in serious disagreement with those of NTPC. The BLM cautions (page 3-18) that the trajectory is sensitive to variations in the currents and wind. We agree and add that because of these variations Admiralty Bay might be affected as well. This possibility is clearly shown in Figures 5.4.2.1-1 and 5.4.2.1-2 of the DES where the submarine pipeline was considered.

In summary, the following points might be made. The most important physical processes affecting oil spill movement are included in both the NTPC and BLM models. The apparent differences are primarily due to the differing times for the forecasts. Several ambiguities in the BLM report make it difficult to infer exactly what approximations were made. The wind and current fields used in the BLM model were not presented and therefore could not be compared with those used by NTPC.

References

OIW 1978a. Oil Spill Risk Analysis. Prepared for the Federal Northern Tier Pipeline Environmental Statement Vols. I and II by the Oceanographic Institute of Washington, 6 October 1978.

OIW 1978b.
- Existing and Incremental Oil Spill Risk Analysis.
- Oil Spill Environmental Protection Devices.
- Fire and Explosion Hazards: Analysis and Mitigation for the Federal Northern Tier Pipeline Environmental Statement, prepared by the Oceanographic Institute of Washington, 17 November 1977.

Cultural Resources

The discussion of cultural resources provides a general overview of the project's potential impacts and discusses the possibility that significant materials may be disclosed during project construction. Comments below basically cite the need for clarification of certain statements.

| Page, Column, Paragraph | Comment |
|---|---|
| 2-103 C1, P3 | ㊳ The BLM states that: "it is virtually certain that cultural resources will be discovered along the proposed corridor." Clarification is necessary for distinguishing the corridor and the actual pipeline right-of-way. The area of potential impact will be much smaller than the corridor. |
| 2-104 C1, P2 | ㊴ Mention should be made that state site records were consulted in addition to the National Register. This is only footnoted at the end of the site listings. |
| 2-108 | ㊵ The section on paleontological resources might include a discussion of the relative significance of different types of paleontologic materials. |
| 2-110 | ㊶ Ediz Hook Lighthouse should be included in the listing of historic sites. |
| 3-35 C2, P5 | Archeological beach sites cited as potentially affected should be included in Table 2.1.2.10-1. |
| 3-35, C1, P3 | Shipping associated with the NTPS would not be out of character with the historic context of the old Ediz Hook Lighthouse. The original intent of the early navigation aid was to assist all forms of maritime activities. The presence of tankers and modern berthing facilities could be part of any future interpretive exhibit for the site. |
| 3-36, C1, P7 | Further clarification would be appropriate concerning the relative significance of paleontological materials at Green Point. |
| 3-94, C2, P2 | ㊷ Among the potential indirect impacts listed is the "intrusion of equipment and the line itself across the traditional homelands of Native American populations." Although this could apply to all land in North America, the reference best applies to those properties recognized today as tribal land (e.g., reservations). It is not clear that either direct or indirect impacts would result if the proposed pipeline and related facilities were to include recognized tribal lands. |
| 3-95, C1, P3 | ㊸ The BLM statement that "Unless the final pipeline route were carefully aligned to avoid known sites, they would be directly impacted." implies that sites are known that would be affected. However, the text of this section begins by acknowledging that numerous sites exist along the pipeline route (meaning corridor) but then states that: "...existing site inventory data and the proposed project location and design feature information are presently not adequate for complete and accurate determinations of effects." Clarification of construction phase impacts is needed to indicate that no direct impacts on cultural resources have yet been identified. Only the potential for direct impacts is suggested (see Summary in Section 3.2.10 C2P1). |
| 4-5 | ㊹ Measures 2A and 2B. Measures taken during construction to ensure protection of cultural resources not identified prior to construction include a selective monitoring program. The BLM DES states that if materials are found, work would be required to stop. This is not the most desirable or feasible means of managing the resource if materials are found. Work in an area designated by BLM cultural resource personnel would be suspended until an evaluation of the resource is made. In all likelihood, work would continue at other points further along the pipeline with continued monitoring as necessary. |
| 4-5, C2, P4 | Washington State law requires any person, firm, corporation, or agency to obtain permission from the State Historic Preservation Officer for excavation of cultural resources on public land or from the owners of private land. The state does not have the authority to administer the disposition of cultural resources on privately owned property (Chapter 195, Section 11). |
| 5-7, C2, P1 | ㊺ Indirect impacts on historic structures need qualification. |
| 9-5, C2, P2 | The BLM's Programmatic Memorandum of Agreement with NTPC and the five Northern Tier states should be cited. |

Visual and Recreational Resources

With the exception of the comments below regarding the visual resource analysis, the information and study results reported in the DES are thorough and complete.

| Page, Column, Paragraph | Comment |
|---|---|
| 3-37, C1, P4 | The DES states that: "The panoramic viewshed of Port Angeles Harbor would be radically altered by construction of the tanker berths and support facilities on Ediz Hook. Though not differing in kind, the scale of this activity would visually dominate the existing waterfront industries...". The NTPC aesthetics impact analysis indicates that the viewshed will not be altered (see Figure III-1.19-3 in the NTPC EFSEC Application), that the berthing structures will not conflict in general appearance with those already present, and that the visual character of the tanker unloading facilities will be dominated by the tankers, when they are present, and not by the berthing facilities. (See Figures III-1.19-1, views 5 and 6, and III-2.13-1 in the NTPC EFSEC Application.) |
| 3-37, C1, P6 | ㊻ The DES states that: "Much more significant impacts would occur when the two submarine pipelines were extended through the 120-foot cliff to connect with the tank farm on Green Point... (this activity) would be highly visible to residents and tourists." The NTPC viewshed analysis (Figure III-1.19-3 of the NTPC EFSEC Application) indicates the viewing area from which onsite activity can be seen. A minimum buffer of 65 to 100 feet of existing mature coniferous trees will be maintained around the entire site. The only viewers within a 5-mile radius expected to see construction activity are those immediately adjacent to the site, and three residences are in the open agricultural lands west of the site. Activity associated with the bluff excavation is expected to be visible only from offshore. |
| 3-96, C2, P2 | ㊼ The DES states that: "Of the 433.5 proposed route miles in Washington, 174 miles would parallel or superimpose the BPA right-of-way." The NTPC analyses indicate that total powerline right-of-way followed within the State of Washington is 176.5 miles out of a total route length of 435 miles. The route as proposed will also follow 23.3 miles of existing pipeline right-of-way and 21.8 miles of existing railroad right-of-way, for a total of 221.0 miles of existing cleared right-of-way, or 51% of the total route length in Washington. |

General

Many of the visual evaluations are purely subjective and may in fact be misleading. In the baseline visual analysis, for instance, reference is made to the harbor area as having a very high level of visual quality (A or A/B), largely due to the "novelty" of having pulp and paper mills, harbor traffic, etc. Yet, they say in the impact analysis that the operation of the unloading facilities will have a negative impact on visual quality. If one were consistent, it could be argued that an unloading dock may also represent a "novelty" aspect.

Land Use

The DES adequately addresses land issues related to the NTPP. Inconsistencies with the NTPC EFSEC Application and other comments are presented below.

| Page, Column, Paragraph | Comment |
|---|---|
| 2-60, C2, P3 | ㊽ Discussion of state and local government zoning and comprehensive plans should indicate that the text of Clallam County's Zoning Ordinance was declared void by the Washington Supreme Court. |
| 2-113 | Source for Table 2.1.2.10-1 should be NTPC. The heading in the first column of the table should read "All Land Uses." Also, statements (C1, P4) regarding urban and residential land uses along the pipeline route are not consistent with the above table, which shows that only 3.0 miles of urban/built-up land are traversed by the pipeline route in Washington. |
| 2-119, C2, P2 | ㊾ The discussion of land should also indicate how much prime farmland there is in each state. Then prime farmland in right-of-way versus elsewhere in state can be compared to indicate the effect of the proposed pipeline. |
| 3-40, C2, P2 | The size of the onshore storage facilities site should be 243 acres. |
| 3-2 | There are numerous comments made throughout the discussion of pipeline system impacts relating to impacts of access roads. In all but the most rough terrain, access will be obtained by existing roads and the pipeline right-of-way. |
| 3-106, C1, P2 | ㊿ How large is the assumed spill on agricultural lands? The frequency of one spill per 0.8 year is provided but no spill size is indicated. The same comment applies to discussion of impacts on rangeland/shrubland and forest/woodland. |
| 4-5, C2, P7 and<br>4-8, C1, P3 | (51) In the NTPC EFSEC Application, NTPC included a number of committed mitigation measures that should be described in the DES. These include relocation of the Puget Sound Pilots Association and the recreational boating facilities based on Ediz Hook, and making minor pipeline route changes to minimize impacts on existing and planned residential areas and subdivision. |
| 5-8 | (52) Table 5.1.12-1 is inaccurate. The NTPC has committed to relocating the pilot station and recreational boating activities on Ediz Hook. |

Transportation and Utility Networks

Certain discrepancies are noted between the DES and the NTPC EFSEC Application. The transportation analysis does not fully follow from data presented in the DES and certain assumptions are not specified. The discussion of electric energy impacts should be revised to describe implications of the power requirements of the pipeline in the event of an operating shortage (versus the current planning shortage) on the BPA system. Specific comments are noted below.

| Page, Column, Paragraph | Comment |
|---|---|
| 2-32, C1, P6 | (53) The relevance of summer weekend peak traffic to the proposed action should be stated either in this section or in the impact section. |
| 2-36 | (54) Table 2.1.1.13-5 does not indicate dates (years) for the forecasted loads. |
| 2-162, C2, P9 | (55) The discussion of future power availability should indicate implications of pending federal legislation that would require BPA to continue to provide power to meet the load growth of its preference customers. |
| 3-42, C1, P4 | (56) The NTPC EFSEC Application indicates that the submarine pipeline construction is to occur between December 1979 and February 1980 (not June through September 1980). |
| 3-42, C1, P5 | Should be 933,000 bpd throughput. |
| 3-42, C2, P1 | Should be 395 (not 390) tanker calls per year at ultimate throughput. Also, it is not possible to verify the stated 34% and 44% increase in commercial traffic from data given in Table 2.1.1.13-1 without further explanation. Similar explanation for the derivation of the stated 145% and 188% increase in large vessel traffic is needed. |
| 3-43, C1, P2 | (57) The maximum number of construction personnel (90) would be required for only the two peak months of tanker berthing facilities construction, not for "most of the construction period." The number of trucks (round trips) estimated by NTPC for the second through fourth quarter of construction was about 16 per day, an average figure that assumes all deliveries to be concentrated in the normal Monday through Friday (five-day) work week. If deliveries are spread over six days, the figure is even lower. |
| 3-43, C1, P3 | (58) It is not clear what is meant by a 75/25 east-west split in traffic. If this sentence is intended to imply that 75% of construction worker and truck trips would originate west of the Green Point site, then the basis for this assumption should be stated. |
| 3-43, C1, P4 | (59) The peak construction months for the marine terminal based on estimates presented in the NTPC EFSEC Application are May and June 1980 (not February and March 1980 as is stated). |
|  | The figure of 420 workers commuting through Port Angeles (for the peak marine terminal construction months) is close to 75% of the average number of construction workers (626) estimated for May and June 1980. The validity of the BLM figure, therefore, depends on the reasonableness of the inferred assumption that 75% of construction related trips originate west of Green Point. |

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|---|---|---|
| (59) | | The average number of trucks (round trips) would not exceed 15 to 20 per day based on NTPC estimates. The BLM figure of 90 trucks per day overestimates the actual number by a factor of five or six.<br>Construction related traffic would decrease to about 40% to 50% of the peak value after the peak two months, not 20% to 60%. |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (60) | 3-46, C1, P5 | Data in the text and in Table 3.1.13-3 do not agree with data in the NTPC EFSEC Application. The DES text describes forecasted loads without specifying the year (1981 or 1985). Furthermore, data in the NTPC EFSEC Application indicate that the City of Port Angeles will have an allocation from BPA of 93 average MW and that the Clallam County PUD will have an allocation of 61 average MW. According to data in Table 3.1.13-3, demand in 1985 for the City Light Department would be 108.6 average MW, or 15.6 MW more than the allocation (not 19 MW as noted in the text).<br>The 1985 forecasted average load for the county PUD of 132.5 MW does not agree with the 71.7 MW figure in the NTPC EFSEC Application. (If Table 3.1.13-3 were correct, it would mean that the county PUD's load will grow from 58 to 132.5 average MW from 1981 to 1985, an increase of 128%.) Using the 71.7 MW figure, the county's BPA allocation would be 10.7 average MW less than average load, not 7.5 MW as noted in the text. |
| (61) | 3-46, C2, P1 | The Official Statement prepared by WPPSS indicates that power available from nuclear units 4 and 5 will be about 6 MW per unit (total 12 MW) to the city and 17 MW per unit (total 34 MW) to the county (Official Statement of WPPSS, 23 May 1978). Thus, the two utilities will have twice the amount of energy available as indicated in the DES.<br>The changes suggested in the above comments are summarized in the following table. |

Page, Column, Paragraph

Comment

| Serving Utility | 1985 Average Load (MW) | BPA Allocation Effective 1 July 1983 (average MW) | Shortfall Without Additional Power Supplies (average MW) |
|---|---|---|---|
| Port Angeles City Light Dept. | 108.6 | 93 | 15.6 |
| Clallam County PUD | 71.7 | 61 | 10.7 |

The language regarding the extent of power shortages based on the above forecasts should be revised to reflect the corrections. In addition, forecasted energy dates of WPPSS units 4 and 5 should be considered. (See the most most recent PNUCC West Group Forecast and page 15 of the WPPSS Official Statement to determine availability of the additional power. These documents suggest that units 4 and 5 will not be fully operational (generating at full capacity) until 1986 and 1987, respectively).

| | | |
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| (62) | 3-46, C2, P3 | Statements made in the last paragraph of the Operation Phase discussion are misleading. While the available forecasts certainly support a planning shortage, allocation procedures in the event of an operating shortage (when power resources are inadequate to meet actual demand at a given time) suggest that NTPC facilities will not adversely affect the availability of power in Clallam County since BPA will be able to curtail sales to nonfirm loads (i.e., to the direct service industries) to avoid curtailing sales to its firm (preference) customers. There are certain additional steps that can be taken by both BPA and the Governor of Washington to avoid or to minimize such curtailments. Discussion with BPA could help to clarify and to expand the analysis of NTPC's impacts on power availability. |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (63) | 3-109, C2, P2 | It is not at all clear how an inspection flight every two weeks can have a statistically significant impact on the collision risk at an airport with 25,000 or more operations annually. Even if each "penetration" by an inspection flight is considered as equivalent to adding one "operation," this amounts to no more than 0.1% of the total at any of these four airports. |

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| (64) | 4-6 to 4-8 (Section 4.13) | In Section III-5.3.17 of the NTPC EFSEC Application, NTPC included committed mitigation measures that should also be included in the DES. These concern electric energy conservation.<br>To define potential mitigation measures, NTPC is examining alternative approaches to obtaining electric power or driving pump stations with other sources of energy where power may not be readily available from local utilities. |

Social and Economic Conditions

There are some major problems noted with the analysis of impacts, particularly with respect to derivation of figures, assumptions, and the general methodology of the analysis. Data presented in Chapter 3 of the DES do not agree with the results of analyses presented in the NTPC EFSEC Application. Specific comments and questions are noted below.

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (65) | 2-41, C2, P1 | Clallam County total employment in 1976 was 16,450 and unemployment was 9.8%. |
| (66) | 2-42, C2, P2 | The Washington Department of Social and Health Services estimates that there are nearly 1,000 transient units in Clallam County, not 800. (See Table 2.1.1.15-1 on page 2-141.)<br>What is the data source for 1% rental vacancy estimate? |
| (67) | 3-49, C2, P3 | Additional explanation is necessary to verify the conclusions of the DES. For example, how were population estimates derived? What assumptions were used with respect to the percentage of nonlocal construction workers who would in-migrate to the county? What multipliers were used to establish indirect and induced populations?<br>How can the June 1981 population be 100 and the July 1980 population be 100 when there will be a total of only 18 construction workers in each month? |
| (68) | 3-50, C1, P1 | How were population estimates derived? What multipliers were used? The NTPC estimate of operations period total population growth (direct, indirect and induced) is 233, not 307 (see the NTPC EFSEC Application). |
| (69) | 3-50, C1, P3 | The average work force in Clallam County over the 22-month construction period is 217 workers not 450. The peak is 670 not 755. |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| | | What is the basis for the statement that: "The initial phase would employ at peak about 160 local workers on the construction work force..."? What local-nonlocal distribution was assumed? |
| (70) | 3-52, C2, P6 | The basis for the estimate that 200 children would be added to the area's school population is not provided. |
| | 3-53, C1, P2 | The per pupil expenditures cited, as furnished by the Port Angeles School District, are about 50% higher than the 1976-1977 data furnished by the Washington Superintendent of Public Instruction and included in the NTPC EFSEC Application. |
| (71) | 3-53, C2, P1 | No literature reference is provided to document the suggested increase in misdemeanor as a result of NTPS construction. |
| (72) | 3-53, C2, P6 | The local newspaper is not an authoritative source on the question of responsibility for fire protection. Recent data received by NTPC from the city suggest the [illegible] water line on Ediz Hook likely has sufficient capacity to meet NTPC construction-related fire fighting needs. |
| (73) | 3-54, C1, P2 | It should be noted that the city fire department would not have primary responsibility for fire safety and fire fighting in conjunction with the NTPC facilities. Fire protection at petroleum facilities is historically provided by the firms that operate the facilities since these firms have the specialized expertise, equipment, and trained staff to deal with such fire protection needs. The NTPC EFSEC Application describes in detail fire protection systems to be provided by NTPC. |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (74) | 3-117, C2, P2 | What is the basis for mainline pipeline worker estimates? Even for all other project components, |
| (75) | 3-119, C2, P3 | what is the basis for assuming that "for counties with less than 35,000 population, 10% of the in-state work force was estimated to be local and that for counties with 100,000 population, 50% was estimated to be local"? |

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| (76) | 3-120 | The construction work force estimates by month are totally inconsistent with those provided in the NTPC EFSEC Application. This effects the entire social and economic impact analysis. |
| | 3-122 (Table 3.2.15-3) | Construction work force estimates by county and by time interval are totally inconsistent with those provided in the NTPC EFSEC Application. For instance, how could there be 125 construction workers in King County from August 1980 through November 1980 when the only activity in the county during this period will be the construction of a pump station. During this period, the pump station will require an average of less than 42 workers. |
| (77) | 3-123 (Table 3.2.15-4) | What employment multipliers were used? What was the basis for selecting these particular multipliers? |
| (78) | 3-124 (Table 3.2.15-6) | Total construction costs in Clallam County are estimated to be $130,515,000 not $117,542,000. All other construction cost estimates by county are also inconsistent with estimates in the NTPC EFSEC Application. |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (79) | 4-8 (Section 4.15) | In Section III-5.3.15 of the NTPC EFSEC Application, NTPC specified additional committed mitigation measures that should be included in the DES. The following actions are specified: provision of a fully equipped and manned fireboat in Port Angeles Harbor and provision of a fire truck at the onshore storage facilities (in addition to other built-in fire protection systems), an independent third-party evaluation of the firefighting systems and procedures, and an analysis of any possible effects on fire insurance rates.<br>In addition, as a potential mitigation measure, NTPC has indicated its willingness to consider making prepayments of property taxes under certain conditions. These conditions are also noted in Section III-5.3.15 of the NTPC EFSEC Application. |
| (80) | 5-11 | The number of 154 new students in Table 5.1.15-1 does not agree with the text of Chapter 3. Specifically see page 3-52, which indicates 200 students would be added during construction. |
| (81) | 6-2, C1, P2 | These two sentences, taken together, appear to cast a very negative light on the entire marine terminal component that may be unwarranted in view of the impact chapters of the DES. It is not at all clear how the "short-term commitment of the area's resources" would impede maintenance and enhancement of area resources in the long term. If oil spill risks are what the authors have in mind, then clearly this sentence is a nonsequitur. More serious, however, is the second statement, which refers to a perception (presumably by the local |

| Page, Column, Paragraph | Comment |
|---|---|
| | populace and/or environmental activists) that the project would have "potentially long-term risks to health (and) safety..." This statement, taken as it stands without further qualification (and in the context suggested by the statement immediately preceding it) could be inferred by the reader as meaning that the DES authors are the ones making this blanket judgment. |

Alternatives to the Proposed Action

Some alternative projects considered by BLM differ from those considered by NTPC, and the relative emphasis and level of detail presented for such projects as well as for alternative port sites and pipeline route segments differ. However, the conclusions reached by BLM are fairly consistent with those reached by NTPC. Some specific comments on the text follow.

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (82) | 8-4, C1, P2 | In the description of the Stampede Pass route alternative, it should be noted that this route would have crossed 1.5 miles of the Cedar River watershed (in addition to the 28 miles crossing the Green River watershed mentioned in the DES), which furnishes water to the City of Seattle. |
| (83) | 8-5, C1, P5 | It would be appropriate to state for the Alaska-Alberta Pipeline alternative that air pollution impacts would be experienced at Haines and Skagway. |

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|---|---|---|
| (84) | 8-6, C2, P1 | The statement that the Mid-Continent Pipeline System has a capability of expansion of 875,000 bpd should be clarified. This expansion capability does not represent a total potential increase in capacity from the Gulf Coast into the Northern Tier states because it represents a sum of expansion capabilities for a number of pipeline systems, many of which do not originate on the Gulf Coast and some of which are product pipelines that could transport crude oil only at the expense of product shipments. It should also be noted that the Mid-Continent Pipeline System is not capable of supplying any of the refineries in the Northern Tier states west of Minnesota. |
| (85) | 8-10, C2, P4 | The discussion of existing $SO_2$ air quality at Cherry Point should be clarified. Why are the model results likely to be overestimates? What do the model results mean? |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| (85) a | 8-36, C1, P6 and 8-83, C2, P3 | The traffic assessment performed by NTPC for the Low Point alternative concluded that while the *relative* peak hour construction impact on S.R. 112 west of Port Angeles would be significant, the roadway would still be operating at only about 60% capacity, implying a level of service A or B. |
| (86) | 8-44, C2, P3 | When referring to the greater risk of at-berth spills for single point moorings at Low Point and Freshwater Bay, it should also be noted that spills would also be much more difficult to contain and clean up at an offshore location (because of wind, wave, and current conditions) compared to a fixed berth site in Port Angeles Harbor. |
| (87) | 8-98, C1, P3 | The statement that: "Canada would benefit by either of the proposals (Foothills) as it would permit access of Canadian markets to foreign crude oil, if the need should develop in the future" should be expanded to note that the Northern Tier Pipeline System, through its connection to the Lakehead/Interprovincial System at Clearbrook, would also provide eastern Canada with access to foreign crude through a west coast port. |
| (88) | 8-105, C1, P5 | With regard to the Trans-Mountain Reversal project, the statement that: "The 180,000 bpd (average) pumped to Edmonton would be distributed to deficient areas in the Northern Tier and Midwest states through the same common-carrier pipelines that previously handled the Canadian deliveries" is only partially true since oil cannot move to Billings, Montana, refineries from Edmonton over existing pipelines. The existing pipeline system (Texaco) south of Edmonton flows north and, thus, |

| | Page, Column, Paragraph | Comment |
|---|---|---|
| | | oil cannot move south to the Billings refineries without the construction of a new pipeline link to the Rangeland System, which does flow south. |
| (89) | 8-113, C2, P2 | See previous comment on statement made on page 8-6 regarding expansion capability of 875,000 bpd for the Mid-Continent System. The statement that: "Most of these increases, 530,000 bpd, would be from the Gulf Coast" should be clarified. This additional capacity of 530,000 bpd would be from the Gulf Coast to Cushing, Oklahoma, which would not solve crude oil shortfalls in the Northern Tier states. |
| (90) | 8-113, C2, P4 | The following comments relate to the discussion of the major new pipelines being proposed. There are five planned projects listed, not six. The statement that: "If all lines were built, the total maximum increase in capacity would be about 3,490,000 bpd." is misleading because all the projects listed do not represent additional pipeline capacity into the upper Midwest and Northern Tier states. SOHIO and Four Corners represent additional capacity into the Gulf Coast area, not the upper Midwest and Northern Tier states. Northern Pipeline must depend on other pipelines or barges for supplying its line out of Wood River. Therefore, the planned capacities of these lines cannot be summed and represented as an increase in total pipeline capacity for supplying the Northern Tier and upper Midwest states. |
| (91) | 8-114, C2, P3 | The statement that: "Following shipment to Gulf Coast Ports, the Alaskan crude oil would be distributed to the Northern Tier states through the Mid-Continent Pipeline System" is misleading because Mid-Continent pipelines cannot supply refineries in the Northern Tier states [illegible] of Minnesota. |

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CONT

TABLE 1

COMPARISON OF NTPS TANKER OIL SPILL RISKS*

| Source of Estimate | In-Transit Tanker Oil Spills: Less than 10,000 bbl | In-Transit Tanker Oil Spills: Greater than 10,000 bbl | At-Berth Tanker Spills: Less than 10,000 bbl | At-Berth Tanker Spills: Greater than 10,000 bbl | Spills at Single Point Moorings |
|---|---|---|---|---|---|
| BLM | 1 in 5.53 years<br>203 bpy average | 1 in 88.2 years<br>spill greater than 10,000 bbl | 1 in 0.51 years<br>137 bpy average | 1 in 355 years<br>spill greater than 10,000 bbl | 1 in 0.21 years<br>spill size greater than 3.6 bbl |
| NTPC | 1 and 4.8 years<br>255 bpy | 1 in 86.2 years<br>total loss of cargo | 1 in 0.14 years<br>144 bpy | 1 in 266 years<br>total loss of cargo | 1 in 0.09 years<br>average size of spill, 7 bbl |

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*Based on 395 NTPS tanker trips at the ultimate design capacity of 933,000 bpd

TABLE 2

COMPARISON OF PIPELINE AND STORAGE FACILITIES OIL SPILL RISKS FOR NTPS*

| Source of Estimate | Oil Spills at the Onshore Storage Facilities: Small Leaks (less than 1,000 bbl) | Oil Spills at the Onshore Storage Facilities: Large Leaks (greater than 1,000 bbl) | Pipeline Oil Spills: For Submarine Portion of NTPS (spills per mile) | Pipeline Oil Spills: For Onshore Portion of NTPS (spills per mile) |
|---|---|---|---|---|
| BLM | 1 in 0.50 years | 1 in 53 years | 0.0008 ± 0.0006 | 0.0022 ± 0.0022 |
| NTPC | chronic<br>(no estimate) | greater than<br>1 in 100 years | 0.0012 | 0.0012 |

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*Based on 395 NTPS tanker trips at the ultimate design capacity of 933,000 bpd.

TABLE 3

COMPARISON NTPS OF FIRE AND EXPLOSION RISKS*

| Source of Estimate | Fire at Onshore Storage Facilities | Tanker Fire and Explosions in Port Angeles Harbor | Fire at Tanker Unloading Facilities | Possible Effect of a Fire/Explosion in Harbor Area |
|---|---|---|---|---|
| BLM | 1 in 32 years | 1 explosion in 521 years | 1 fire in 12.24 years | Minimal effect on the City of Port Angeles susceptible area within 2,250 feet. |
| NTPC | 1 in 40 years | 1 total loss every 715 years caused by fire/explosion | 1 fire/explosion in 14.9 years | Negligible or no effect on the City of Port Angeles susceptible area within 1,500 feet. |

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*Based on 395 NTPS tanker trips at the ultimate design capacity of 933,000 bpd.

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MUCKLESHOOT INDIAN TRIBE
RESOLUTION NO. 79-59-5

WHEREAS, the Muckleshoot Indian Tribal Council is the governing body of the Muckleshoot Indian Tribe of the Northwest, by authority of the Constitution and By-Laws of the Muckleshoot Indian Tribe as approved May 13, 1936, by the Secretary of Interior, and,

WHEREAS, the Muckleshoot Indian Tribe of the Northwest have by reason of the Boldt Decision in United States vs. Washington, recognized usual and accustomed fishing grounds stations guaranteed by the Treaty of Point Elliott in the waters of Puget Sound, and,

WHEREAS, the Northern Tier Pipeline Company is proposing to construct an oil off loading facility at Port Angeles, Washington and oil transportation pipeline around or through the waters of Puget Sound, and,

WHEREAS, this pipeline would cross three lobes of Puget Sound or more than 40 major rivers and streams draining into Puget Sound, and,

WHEREAS, a recent Department of Energy Study casts serious doubts on the economic necessity of this proposal, and,

WHEREAS, this pipeline carries with it the risk of oil spillage into water flowing into Puget Sound or directly into the main waters themselves, and,

WHEREAS, the Puget Sound salmon production alone carries present annual processed value of $69,500,000, and,

WHEREAS, many treaty and non-treaty fishermen rely on this resource for thier livelihood, and,

WHEREAS, any spillage of oil into the waters of Puget Sound or its tributary rivers and streams would cause serious and irrepairable damage to the resource, and,

WHEREAS, many more millions of dollars of commercial fish and shellfish residing in Puget Sound would also be seriously damaged, and,

MUCKLESHOOT INDIAN TRIBE
RESOLUTION NO. [illegible]

WHEREAS, the quality of life in Washington State depends heavily on the rivers, beaches and waters of Puget Sound and,

WHEREAS, these waters are sheltered and, as such, any damage to these waters and the resources dependent on them would be extremely slow in recovering from a major oil spill, if recovery occurred at all, and,

NOW, THEREFORE BE IT RESOLVED, that the Muckleshoot Indian Tribe of the Northwest is of the opinion that Northern Tier Pipeline Company's proposed Crude Oil Transport system would be damaging and detrimental to the public interest and imperils the fisheries resources of the Muckleshoot Tribe of the Northwest and, consequently, is totally unacceptable as proposed, and,

AND BE IT FURTHER RESOLVED, that the Muckleshoot Tribe of the Northwest strongly urges consideration of alternative proposals which do not effect the waters of Puget Sound.

CERTIFICATION

As Secretary of the Muckleshoot Tribal Council, I hereby certify that the above resolution was duly adopted at a regular/~~special~~ meeting of the Muckleshoot Indian Tribe on the 26 day of March, 1979, held on the Muckleshoot Indian Reservation, Auburn, Washington, at which a quorum was present, by a vote of 45 for 0 against 0 abstentions.

Shirley Doxtator, Secretary

ATTEST:

Cliff Kelline

Cliff Keeline, Chairman

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U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

[illegible] 1979

Al Leonard, Project Manager
Northern Tier Project Office
Bureau of Land Management
700 N.E. Multnomah, Suite 1250
Portland, Oregon 97232

Dear Mr. Leonard:

We have completed our review of BLM's draft environmental impact statement (DEIS) on the Northern Tier Pipeline Company's proposed Crude Oil Transportation System. We have concluded, based upon this review as well as our review of supporting technical studies and citizen testimony at public hearings, that the DEIS is seriously inadequate. We have also concluded that the DEIS, when viewed within the context provided by the U.S. Department of Energy draft report entitled "Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000", does not yet provide the type of information or analysis necessary to provide reasonable bases for comparing the alternative proposed crude oil transportation systems as required by Title V of the Public Utility Regulatory Policies Act of 1978 (Public Law 95-617, hereinafter referred to as "Title V").

Our major concerns with regard to the technical content of the DEIS are outlined below. The attachments to this letter provide detailed comments on the DEIS and on the analyses which we believe should be performed in order for the final environmental impact statement (FEIS) to provide a useful basis for Federal agency recommendations with regard to which proposed transportation system, if any, should be approved by the President and Congress.

Need for a Transportation System

① Our comments on the U.S. Department of Energy draft report, mentioned above, will be provided to the Department of Energy (DOE) and your office by the April 20, 1979 comment deadline. We believe that the DOE study, in its final form, will determine, in part, what systems and system capacities should be analyzed for the FEIS. In particular, if DOE confirms its estimate of crude oil transportation system capacity needs then the Northern Tier proposal would have to be evaluated at the probable throughput rate of 200,000-400,000 barrels per day by the year 2000 (plus any additional throughput to serve Puget Sound refineries).

Air Quality

As you know, we have serious concerns about the technical adequacy and validity of the technical studies that were performed for BLM to evaluate the air quality effects of the Northern Tier proposal. Our comments on the technical study, which was performed by Science Applications, Incorporated (SAI), were sent on December 1, 1978. We are in the process of completing our review of SAI's response to those comments and have identified the following concerns to date:

② 1. The DEIS's discussion of air quality effects and the numerical estimates of these effects (in the DEIS) do not track with or correlate with the numerical estimates in the SAI study, even though the DEIS cites the SAI study as the principal source document. In the absence of an explanation the DEIS analysis therefore appears to be unsupported.

2. The SAI response tends to underestimate the degree of uncertainty in the impact predictions which result from using the selected Port Angeles meteorological data.

3. The SAI response appears to underestimate pollutant emissions from the terminal and onshore storage facilities.

③ 4. The use of Port Angeles meteorological data for the analysis of air quality effects at the Low Point site appears to be questionable.

④ 5. Terrain impact problems for tanker emission plumes need to be treated in substantially more depth by the analysis.

Additional detailed comments regarding the DEIS's air quality discussion are contained in Attachment I. We will provide a detailed response to the SAI response to our December 1 comments after we have had the opportunity to discuss it with your staff and SAI's technical staff.

Water Quality

⑤ The DEIS's analysis and discussion of water quality impacts is generic and qualitative. It needs to be revised so that it specifies whether potentially affected water bodies currently meet the applicable water quality standards. If there are current standards violations, the causes of these violations should be identified, where possible. The DEIS should then evaluate whether terminal/pipeline construction and operation would result in any additional standards violations or in the aggravation of existing violations.

It should, within that analysis, evaluate the effects on water quality of the treated site runoff discharges from the terminal area and the onshore storage facility, which are likely to contain small concentrations of crude oil as well as other contaminants.

The discussion of oil spill impacts on aquatic resources is qualitative and generic; that is, currently it does not quantify the possible and probable impacts of oil spills at the terminal site, enroute to it, or along the pipeline route. ⑥ Additionally, the discussion of the resources potentially affected apparently undervalues some of these resources. For example, testimony by officials of the British Columbia fishermen's labor union indicates that the Canadian commercial fisheries were undervalued by an order of magnitude. On the latter problem, we recommend that the estimates be verified and revised where necessary. It would also be useful if the FEIS explained how the value estimates were derived (for example how did the Washington State Department of Fisheries develop its estimates). ⑦ On the former problem, we believe that a quantitative comparison of the potential impacts of oil spills associated with the alternative port sites and the alternative transportation systems is essential.

Such a quantitative analysis would, within the limits imposed by the state of our knowledge with regard to the movement of spilled oil and the fate and effects of oil in marine and freshwater environments, estimate the losses which would result from oil spills of different sizes at different locations. Among the spill sizes examined should be the large magnitude spill which would result from the total loss of a Very Large Crude Carrier (VLCC) such as occurred off the coast of France in the Amoco Cadiz sinking.

CONT

Additional detailed comments regarding the DEIS's water quality impact analysis and technical problems with the oil spill risk analysis are contained in Attachment I.

Drinking Water Quality

⑧ Possible effects of the crude oil pipeline on drinking water quality are given a rather brief discussion in the DEIS. Given that most of the streams which the pipeline route crosses on the Olympic Peninsula serve as public water supplies, the FEIS should locate these streams and their watersheds on the detailed maps in the map addendum. It should quantify the possible effects of an oil spill on each potentially affected water supply.

⑨ The Spokane Valley-Rathdrum Prairie Aquifer is also given a very brief mention in the DEIS. As you know, this aquifer has been designated a sole source under Section 1424(e) of the Safe Drinking Water Act. Although the pipeline route does not pass directly over the aquifer, it does pass through a major portion of the stream flow source zone, (that area which recharges the aquifer), and crosses streams which make significant contributions to aquifer recharge. A much more detailed discussion of the aquifer, a quantification of possible impacts, and a discussion of additional possible mitigation measures are needed for the FEIS. Attachment I contains more detailed guidance with regard to the information which should be included in the FEIS.

Secondary Development Impacts

⑩ The DEIS assumes that the construction and operation of a crude oil receiving terminal in Washington State will not lead to secondary development in the petrochemical/petroleum refining industry. It therefore does not analyze the environmental impacts of such development in the vicinity of possible terminals. This assumption apparently conflicts with the record of the industry to date.

The Department of Transportation, in its analysis of possible secondary development associated with a proposed deep water crude oil receiving terminal in Louisiana, found that the correlation coefficient between crude oil supply (terminal location) and petrochemical development was +.89. When these findings are combined with the findings in recent Department of Energy studies that Washington State's refining capacity will need to be expanded by 150,000 barrels per day by the year 2000, it is reasonable to assume that refinery development would accompany/follow the establishment of a new crude oil receiving terminal.

Therefore, the FEIS should analyze in some detail the environmental effects of probable secondary petrochemical industry development at Northern Tier's alternative port sites. ⑪ A similar analysis would need to be performed for the Low Point terminal site proposed by the Trans-Mountain Pipeline Company.

Title V Alternatives Analysis

⑫ The issues which merit attention and the level of detail appropriate for the analysis of each of the main alternatives being considered under Title V are essentially the same as were and are necessary for the Northern Tier proposal. That analysis should be based upon complete and accurate descriptions of the proposed systems (as you know the material in the DEIS is not accurate) and whatever baseline environmental data can be obtained within the time available.

Although Attachment II details our concerns with regard to the DEIS's analysis of alternatives in Chapter 8 and our desires for the FEIS, there are some issues, common to a number of the alternatives, which merit mention here. These "issues" include:

⑬ 1. The ability of the alternative systems to meet the "need" identified in the DOE studies (alternatives that depend on connections to existing systems should be checked to ensure that spare pipeline capacity is available).

⑭ 2. The comparative values of the marine resources exposed to the risk of an oil spill.

⑮ 3. Potable water supplies exposed to the risk of an oil spill.

⑯ 4. A quantification of the damages which could result from a major oil spill.

⑰ 5. The effects of the proposal on ambient air quality in the vicinity of the terminal site.

⑱ 6. Populations exposed to the risk of a terminal fire or explosion and the ability of local public safety personnel to respond to such an event.

⑲ 7. The effects of pipeline construction on the physical environment and aquatic biota as well as the effects of pipeline operation on fisheries.

For each of these issues the analysis and discussion should be quantitative enough to support ranking the alternative systems being considered based upon environmental protection and enhancement criteria.

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Conclusions

As we noted at the beginning of this letter, we believe that the DEIS is seriously inadequate. At the present time, we cannot determine which alternative system, if any, is environmentally preferable, as required by the new CEQ regulations. Similarly, we cannot determine whether the proposed project (Northern Tier) is environmentally acceptable.

As you know, in making the above determination, we normally assign a rating to the proposed action and to the DEIS as a means of carrying out our duties under Section 309 of the Clean Air Act, as amended. However, due to the gaps in the DEIS we are unable to assign one of the normal proposed action ratings (LO: lack of objections; ER: environmental reservations; or EU: environmentally unacceptable). We therefore must give the DEIS a rating of "3" (inadequate). This rating will appear in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under the above referenced section of the Clean Air Act.

Under normal circumstances we would recommend that a revised draft environmental impact statement be prepared and circulated for public comment prior to the preparation of the FEIS, in situations like this one. However, we recognize that Congress, with the enactment of Title V of Public Law 95-617, has called for an expeditious decision making process with regard to crude oil transportation systems serving the Northern Tier states.

We believe that the current schedule for carrying out the requirements of Title V is extremely tight and may impede BLM's efforts to produce a credible FEIS which can serve as one of the major bases for the decision on Northern Tier crude oil transportation systems. We strongly recommend that the Department of the Interior reconsider its Title V review schedule after evaluating the comments received on the DEIS and estimating the amount of time and resources that will be needed to respond credibly to those comments. It is our considered judgement that an extension of the review schedule is almost mandatory if the FEIS and the Report to the President (called for by Title V) are to properly address the substantive decision criteria specified in the statute.

We have appreciated the opportunity to participate in the EIS team's efforts to date and would be glad to explain our concerns in more detail where that would help you in the preparation of the FEIS. In order to arrange any further discussions which you deem necessary, your staff should contact Daniel Steinborn, the coordinator of EPA's participation in the Title V review, at (FTS) 399-1285 or (206) 442-1285.

Sincerely,

Donald P. Dubois
Regional Administrator

cc: Office of Federal Activities
National Park Service (Olympic National Park)
F. Donald Martens, Consul, Government of Canada (Seattle)

ATTACHMENT I

U.S. Environmental Protection Agency
Detailed Comments re BLM's Crude Oil
Transportation Systems DEIS

Chapter 1* - Description of the Proposed Action

Major Items

(20) Pages 44-60. The statement indicates that the pipeline will be covered with a minimum of three feet of soil. For stream crossings, such as the Coeur d'Alene River, the pipe thickness is to be increased and the line will be buried below the stream bed scour level. We recommend that the applicant, if the project is approved, be required to use concrete coated pipe in all streams which contain or support fishery resources and in all streams which serve or affect public water supplies. Additionally, inspection of underwater stream crossings should not be limited to navigable waterways. For those streams which are within the streamflow source zone of the Spokane Valley-Rathdrum Prairie Aquifer the on-the-ground inspection interval should be no more than one to two years. A similar inspection interval should be applied for any stream crossings that are upstream of water supply intakes.

(21) The actual inspection process should be described. Additionally, the means by which water supply operators and other appropriate response agencies will be notified of pipeline-related oil spills should be discussed.

(22) The terminal at Clearbrook, Minnesota would be operated by the Lakehead Pipeline Company. According to our Region 5 personnel this company's operating record has not been particularly good (it has experienced numerous spills). The Final Environmental Impact Statement (FEIS hereafter) should discuss this performance record and indicate what improvements Lakehead could and would make in its operating procedures.

CONT

Minor Items:

(23) Page 5. Table 1.3-1 should note EPA's review of Spill Prevention, Countermeasures, and Control (SPCC) plans under the Federal Water Pollution Control Act Amendments of 1972 as amended by the Clean Water Act of 1977. It should also note our review required by Section 1424 of the Safe Drinking Water Act due to the sole source designation of the Spokane Valley-Rathdrum Prairie aquifer.

(24) Page 11. The discussion of submarine pipeline inspection should describe the ability of the infra-red monitoring system to detect leaks in rough water conditions.

*Note: The chapter number portion of each page number is omitted.

ATTACHMENT I - Page 2

(25) Page 10. One fire boat appears to be totally inadequate. The explosion of the tanker *Sansanea* in Los Angeles harbor required the use of about six fire boats. Location of the fire boats at a safe distance would be required in order to prevent their being destroyed by an explosion.

(26) Page 13. The volume of the runoff water discharge should be estimated (for the onshore storage facility as well as the port facility). If the crude oil contains 2 to 3% water this could be a substantial discharge and, even with the use of oil-water separators, could result in a significant discharge of oil to the receiving water body.

(27) Page 7. We understand that the tanker fleet scenario is extrapolated from data provided by Northern Tier for a throughput of 709,000 barrels per day. A linear extrapolation may be inappropriate due to the constraints imposed by the availability of Jones Act tankers. The ultimate fate of SOHIO's proposed transportation system would affect tanker availability. A scenario should also be developed for whatever throughput is determined to be necessary by the Department of Energy needs study.

(28) Page 18. The pipeline operating pressure should be specified. The margin of safety provided by the maximum yield strength for the pipe should be shown.

(29) Page 35. Although the Clearbrook terminal facilities are not being constructed by the applicant, they are necessary for the system to operate and therefore must be evaluated by this EIS. Similarly, a proposed connecting pipeline from Clearbrook to East St. Louis, Illinois should be evaluated.

(30) Page 40. What steps will be taken to ensure that we do not repeat the weld inspection problems which were experienced with the Alyeska Pipeline?

(31) Page 46. During stream crossing construction the applicant proposes to store excavated material on the stream bottom adjacent to the trench. Such a practice would cause unnecessary sedimentation and damage to downstream fishery resources. EPA would not concur in any Corps of Engineers permit which allowed it. Upland storage or storage on barges should be required.

(32) Lining the trench with bentonite clay in marshy areas could cut off flow within a wetland area and cause portions of it to dry up. A flow maintenance system may be required to preserve the wetlands.

(33) Page 47. Discharges of hydrostatic test water would require an NPDES discharge permit under Section 402 of the Federal Water Pollution Control Act Amendments of 1972 as amended by the Clean Water Act of 1977.

ATTACHMENT I - Page 3

(34) Page 53. The draft DOE report indicates that DOE did not do an independent cost estimate, but took the applicant's estimate at "face value." The estimates should be verified by personnel experienced at estimating costs for pipeline and marine terminal construction.

Chapter 2 - Description of the Affected Environment

Major Items:

(35) Page 14 et seq. (Marine resources). The discussion of marine water quality in Port Angeles Harbor and the Straits of Juan de Fuca does not indicate whether the applicable water quality standards are being met. If they are not being met the causes of the violations should be identified where possible.

(36) Page 57 et seq. (aquatic resources). The discussion of aquatic resources along the pipeline route is poorly organized, hard to use, and incomplete. It should be reorganized so that each stream crossed by the pipeline route is treated as a unit; that is, the physical and biological resources should be discussed together. This discussion should also identify any sensitive downstream resources and water uses which might be affected by pipeline construction or an oil spill.

(37) Public water supplies that are fed by these streams or that could be affected by the pipeline should be identified in the discussion. Their boundaries should be shown on the route/resource maps in the map addendum.

(38) The uses to which ground water resources are put should be identified. Uses which could be particularly affected by construction or an oil spill should be described in enough detail for the reader to be able to understand the sensitivity of the use.

(39) The discussion of surface water and ground water resources should, in addition to listing the applicable water quality standards, indicate whether these standards are currently being met. If standards are not being met, the causes of the violations should be identified where possible.

(40) The Spokane Valley-Rathdrum Prairie Aquifer (mentioned on page 69) should be described in more detail. A map of the aquifer and its streamflow source zone should be provided within the chapter. There should be a summary description of its hydrology and a discussion of why it was designated as a sole source under Section 1424 (e) of the Safe Drinking Water Act. The ability of the soil to "treat" or degrade petroleum prior to its entry into the aquifer should be discussed. If possible the discussion should also indicate the proportion of the aquifer's recharge flow which comes from each of the streams crossed by the pipeline route.

ATTACHMENT I - Page 4

(41) Page 75. The Souris River serves as the water supply for Minot, North Dakota. The EIS should indicate how far upstream of the water supply intakes the pipeline crossings would be. It should also indicate what type of water treatment system Minot uses.

Minor Items:

(42) Page 4. The discussion of the Prevention of Significant Deterioration (PSD) Program is incorrect. All pollutants regulated under the Clean Air Act are subject to the PSD program. Sulfur dioxide and suspended particulates are the only pollutants for which deterioration limits, more stringent than the Secondary Ambient Air Quality Standards, have been established.

(43) Page 10. Map III-2 does not depict the topography of Port Angeles. No map in the Map addendum does.

(44) Page 32. How often is Port Angeles harbor used as a waiting area for tankers enroute to inner Puget Sound crude oil receiving terminals?

CONT

(45) Page 37. The magnitude of recreational boat use in Puget Sound should be stressed. Puget Sound residents have many more boats per capita than the national average. The value of the sport shellfish harvest seems to be too low; the basis for the estimate should be described.

(46) Page 49. The existing climate, air quality, and pollutant dispersion potential for each delivery facility location should be described. Assuming conditions similar to Port Angeles is unsupportable.

(47) Page 52. How has frost heave been eliminated as a problem for oil pipeline construction and operation?

(48) Page 88. The value of Hood Canal for Pacific Oysters should be stressed. We understand that it is the only place on the West coast where they will spat naturally.

(49) Page 6. Conclusions are drawn with regard to daytime and night noise levels but the statistical measure being used (Ldn, Leq, $L_{90}$) is not specified. For each site the dominant noise source and the type of intrusive source which caused the $L_{max}$ during the sampling period should be identified.

Chapter 3- Environmental Impacts of the Proposed Action

Major Items:

Pages 2-8. As you know we still have a number of problems with the air quality impact analyses and their presentation in the DEIS. The concerns

ATTACHMENT I - Page 5

which we have identified to date, in addition to those mentioned in the cover letter, include the following:

(50) 1. The DEIS presents a rather confusing discussion of the fuel sulfur content assumptions which were used in estimating tanker emissions and evaluating compliance with the applicable $SO_2$ standards. The Technical Document indicates a maximum sulfur content of 2% was assumed while the DEIS states in different places that a maximum or an average sulfur content of 1% was assumed. The analysis should probably be based on the expected content (an average of about 2.5% and a maximum of 4.0%). If this analysis indicates that a limitation on fuel sulfur content is necessary in order to assure compliance with the applicable standards, then the analysis should determine what that sulfur content limitation should be. It should then determine whether such fuel is readily available on the West Coast and whether the expected tanker fleet (the ships therein) is equipped with separate fuel tanks to store that fuel for in-port consumption.

(51) 2. The fact that the maximum 24-hour $SO_2$ concentration of 176 $ug/m^3$ would occur only once every five years, as a result of tanker unloading, does not demonstrate that the Class II PSD increment of 91 $ug/m^3$ or the Class I PSD increment of 5 $ug/m^3$ would not be exceeded more than once per year. Additional analysis using terrain interactive models will be necessary to make this demonstration. We have similar problems with the modeling of the combined impacts of the existing facilities and the proposed port facility.

(52) 3. The ballasting emission factor of 0.66 lbs. $HC/10^3$ gallons of water is low by at least a factor of two (see our previous comments on the Technical Document). They will have to be recalculated and the ozone analysis will have to be revised to account for the new emission estimates.

(53) 4. The representative Reid Vapor Pressure (RVP) should be changed to 4.7 psia in accordance with SAI's response to our December 1, 1978 comments. The annual emission estimates for the onshore storage facilities will need to be recalculated to reflect this change, as well as more accurate estimates of the oil storage temperature and the ambient atmospheric temperature. A worst case analysis will have to be done based upon the highest expected RVP accompanied by summer oxidant season temperatures and wind speeds.

(54) 5. Given that the local electric utility does not generate its own power and that it has received a "notice of insufficiency" from its sole supplier (BPA), the EIS should evaluate the air quality impacts of the applicant providing its own on-site power generation on a full-time basis.

ATTACHMENT I - Page 6

(55) 6. Compliance with the annual PSD increment for $SO_2$ in the vicinity of the port site needs to be evaluated and discussed in the EIS.

(56) 7. The need for emission offsets in the Seattle non-attainment area for oxidants and the Port Angeles non-attainment area for suspended particulates should be evaluated in light of the revised EPA Offset Policy.

(57) 8. The FEIS should evaluate the secondary air quality effects associated with the delivery/substitution of Alaskan sour crude for sweet crude oil at Northern Tier states refineries. If refineries do make process changes in order to use more Alaskan sour crude significant air quality impacts could follow. In a number of instances these changes would require the issuance of a PSD permit under the Clean Air Act.

(58) Page 8. EPA assigns the following significance to increased noise levels:

1. 0-5 dBA increase: slight impact
2. 5-10 dBA increase: significant impact
3. 10+ dBA increase: very serious impact requiring mitigation

(59) Page 9. Residents would be annoyed by construction noise from the terminal facility and would be very disturbed by noise from the construction of the onshore storage facility. Operational noise levels at the storage facility would have a very serious impact on nearby residences which merits mitigation.

(60) Page 11. Changes in erosion patterns at Green Point are not evaluated with respect to the "feeding" of Dungeness Spit. Past experience with the relationship between the Elwha River and Ediz Hook would tend to indicate that this could be a significant problem.

(61) Pages 18-34. The oil spill risk/impact analysis merits a number of corrections and expansions: (a) the submarine pipeline risk estimates in the text conflict with those provided in the tables; (b) the in-transit tanker risk estimates apparently ignore traffic density and exposure time as independent variables in the risk analysis; (c) the rationale for the trajectory analyses merits explanation (why were particular months picked and what were the key assumptions in the modeling); (d) the damages associated with a major spill need to be quantified; and (e) the damages associated with chronic spills and discharges in the harbor need to be quantified.

(62) Page 41. Citizen comments at the Port Angeles Public Hearing have raised serious questions about DIW's fire and explosion risk analysis. The numbers presented in the DEIS apparently severely underestimate the damages associated with potential fires and explosions. The analysis should probably be redone and it should address emergency response capability requirements for conceivable "disasters." The estimates at Page 41 appears to conflict with Northern Tier's own estimates (see Page 51).

ATTACHMENT I - Page 7

(63) Page 58. The discussion of the noise impacts of pump station operation should quantify impacts at noise sensitive receptors. It should specify the resulting noise levels and the change in noise levels over existing conditions. In areas where noise sensitive receptors will be exposed to changes greater than or equal to 10 dBA possible mitigation measures should be evaluated.

CONT

(64) Pages 68-80. The discussion of the effects of the pipeline on aquatic and marine resources merits expansion. The information presented on the sediment loads that may be produced during the construction of stream crossings should also note the applicable water quality standards for turbidity and suspended solids. The discussion should indicate for how long a period of time these standards might be violated. The discussion of the effects of a pipeline oil spill at various stream crossings should, for each stream which supports a significant fishery or serves as a potable water supply, quantify the impacts of the maximum possible spill as well as of a spill which was just below the minimum detectable by the pipeline system instrumentation. This quantification should reflect the remoteness of particular sites and the difficulty of moving spill containment and clean-up equipment to the site.

(65) Page 70. There is little or no discussion of the impacts of a pipeline oil spill on potable water supplies or the Spokane Valley-Rathdrum Prairie Aquifer. There should be a generic discussion which provides a detailed chemical analysis of the crude oils to be carried (that analysis should focus on the Priority Pollutants on the attached list). This discussion should give their percentages by volume and weight and describe their physical, chemical and biological characteristics. It should discuss their known and expected health effects when found in water supplies.

Then, on a site specific basis, the EIS should evaluate and discuss the probability of an oil spill or spills reaching individual public water supplies.

For groundwater sources, such as the Spokane Valley system, the ability of the soil to treat and degrade spilled petroleum before it reaches the aquifer should be evaluated.

Minor Items:

(66) Pipeline construction impacts on wildlife in the prairie potholes region of North Dakota need more extensive discussion. The types of impacts that could occur should be described and quantified, where possible. Construction practices and techniques which might reduce these impacts should also be evaluated.

ATTACHMENT I - Page 8

(67) Page 110. The discussion of the effects of pipeline system operation on energy requirements merits some expansion. Although Chapter 2 indicates the magnitude of these requirements on a station-by-station basis, this portion of Chapter 3 does not tell us how significant these power loads would be for the supplying of electric utilities. It should determine which utilities may have difficulty meeting the additional power loads without additional generating resources. For these particular utilities it should then evaluate the air quality effects of the additional generating capacity which would be needed.

Chapter 4 - Mitigation Measures

(68) This chapter focuses on committed mitigation measures, which, in a sense, could be considered a part of the proposed action. What it should do is, based on the impact analysis in Chapter 3, develop additional feasible mitigation measures which would be required by or carried out by agencies of the Federal government. Specific "areas" meriting mitigation measure development are outlined below.

Noise. Construction of the submarine pipelines to the onshore storage facility at Green Point and the operation of this facility might entail significant noise impacts. The FEIS should evaluate possible mitigation techniques, such as modifying construction equipment, restricting nighttime construction activities, and soundproofing adversely affected residences. Under the National Environmental Policy Act, BLM would have the authority to require such actions by the applicant as a condition of receiving a right-of-way across Federal lands.

Aquatic Resources. Additional protection for aquatic resources and potable water supplies from oil spills should be evaluated. For example, the Department of Transportation could require the preparation of a SPCC plan for the pipeline which paid particular attention to these resources. That plan might call for more frequent inspections of stream crossings than proposed by the applicant. It might also require more extensive inventories of spill control and clean-up equipment than proposed by the applicant. It could provide for rapid notification of water supply operators if a spill occurred.

Fire/Explosion Response. The FEIS should evaluate the adequacy of the proposed fire fighting system in light of a revised fire and explosion risk/damage assessment. It should determine what additional equipment and manpower would be necessary to deal with these events and how they could be provided. Possible means of requiring the applicant to meet these needs should be discussed.

ATTACHMENT I - Page 9

The question of the application and enforcement of mitigation requirements is raised and then dropped a number of times in the DEIS. It would be appropriate for the FEIS to evaluate possible Federal administrative mechanisms for monitoring/managing the final design and construction of the proposed transportation system. In particular an organizational structure and management system like that being developed for the Alaska Natural Gas Transportation System should be considered.

Chapter 6, Section 3 - Potential to Supply Puget Sound Refineries

(69) The discussion of the effects of expanding Northern Tier's proposed system to serve Puget Sound refineries needs expansion. First, assuming that the air quality impact forecast is valid, it should be expanded to determine if compliance with the applicable PSD standards is possible with any possible set of mitigating actions, such as limits on fuel sulfur content. Second, it should evaluate the effects of reducing tanker traffic on Northern Puget Sound (reduction in spill risk, reduction in air pollution at refinery sites). Third, it should evaluate the environmental impacts of the pipeline addition from North Bend to the refineries (the spill risk discussion does not quantify probable and possible impacts).

ALTERNATIVE II

U.S. Environmental Protection Agency
Detailed Comments re Analysis of the
Alternatives to the Northern Tier Proposal
(Chapter 8 of the DEIS)

The DEIS' analysis of alternative configurations for the Northern Tier Project and alternative crude oil transportation systems merits major changes in its scope and content. In general the current analysis limits itself to a generic and qualitative comparison of alternatives. It does not address the critical differences in the environmental effects of these alternatives. Our specific comments are presented below in the order in which the topics are addressed in the current chapter.

Port Site Alternatives

The following corrections and additions should be made to the analysis of port site alternatives in the FEIS:

**86** CONT.

(70) 1. Existing environmental conditions (air quality, water quality, noise levels, et al.) should be described in quantitative terms. Compliance with applicable environmental standards should be addressed.

(71) 2. The analysis of air quality impacts improperly assumes that all possible port sites will have meteorological conditions similar to Port Angeles.

(72) 3. The effects of facility wastewater/runoff discharges on water quality should be examined. Compliance with water quality standards should be addressed.

(73) 4. Noise levels as a result of project construction and operation should be predicted. Impacts at noise sensitive receptors are not quantified. Compliance with State noise standards and EPA noise exposure guidelines should be addressed.

(74) 5. The spill risk analysis should account for existing general cargo vessel traffic, barge traffic, products traffic in barges, and recreational boat traffic. The pipeline spill risk estimates conflict with the assumption that length is the primary exposure variable.

(75) 6. The impacts of major and minor oil spills should be quantified.

(76) 7. Impacts on potable water supplies and electrical energy supply systems should be quantified.

(77) 8. The consistency of the alternative port site with the State's coastal zone management program should be evaluated.

(78) Generally, alternative port sites deserve the same detailed analysis and discussion that the proposed port site receives unless the site is technically infeasible. That may be true of the Low Point site because the swing radii for the single point mooring systems may overlap the established navigation channel. That particular problem should be discussed and accounted for in the oil spill risk analysis.

Pipeline Route Segment Alternatives

(79) Cross Puget Sound Pipeline:

The Cross Puget Sound pipeline route segment alternative merits much more attention, particularly now that it is Northern Tier's proposed route. This expanded discussion should address the following topics:

1. Pipe structure and design.
2. Substrate and/or burial material susceptibility to natural removal (and pipe exposure) considering the tidal activity, substrate make-up and bottom contours.
3. Monitoring systems which can be used to detect small leaks/spills before they do significant environmental damage.
4. Failure frequencies for submarine pipelines, corrosion resistance, and other hazards which could lead to a pipeline rupture.
5. The impacts of a pipeline spill (major) provide a quantification thereof.
6. The impacts of the pipeline on anadromous fisheries streams and potable water supplies enroute to North Bend and Snoqualmie Pass.

(80) Stampede Pass Cascade Mountains Crossing:

If the Stampede Pass crossing is a real alternative then a more detailed analysis is required. In particular, a spill risk estimate should be performed and the possible impacts on the Tacoma and Seattle watersheds should be quantified. The costs of protecting these water supplies should be estimated. Possible changes in pipeline design or operational practices which could reduce the risk to the watersheds should also be discussed.

(81) Coeur d'Alene River Alternatives (Idaho):

All three alternative routes cross the Coeur d'Alene River or tributaries to it. The Jackass Ridge route, now the proposed route, merits more detailed and quantitative analysis:

ALTERNATIVE II - Page 3

1. Quantify oil spill risks.
2. Quantify the risk to the Spokane Valley-Rathdrum Prairie aquifer.
3. Evaluate possible mitigation measures to reduce that risk and/or to reduce the possibility of an oil spill reaching the aquifer.

Additionally, alternative route segments which would avoid the streamflow source zone for the Spokane Valley aquifer should be examined.

(82) Ninemile Creek to Helena, Montana:

This alternative poses a potentially severe threat to the environment and potable water supplies in the Helena Valley. The line would cross the Prickly Pear fault. The Valley is characterized by extensive dispersed human habitations which are dependent upon individual wells for their water supply. The risk of an oil spill affecting the ground water supply is thus a serious consideration which merits more analysis in the FEIS.

System Alternatives (under Title V)

As we noted in the cover letter the alternatives to the Northern Tier proposal being considered under Title V merit an analysis similar to that which we have requested for Northern Tier. Particular attention should be paid to the following issues and environmental concerns.

(83) Trans-Mountain Pipeline Co. Proposal:

1. Effects of the terminal and storage facility on ambient air quality in the vicinity of Low Point and in Olympic National Park.
2. Effects of the single point mooring systems (SPM's) on navigational safety in the Straits of Juan de Fuca.
3. Safety of the SPM's at Low Point.
4. Quantification of the effects of a major oil spill at Low Point.
5. Quantification of the effects of chronic minor oil spills at the terminal facility.
6. The ease or difficulty of controlling and cleaning up oil spills in the Low Point area.
7. Changes in Puget Sound tanker and product barge traffic if TMPL also serves Puget Sound refineries from the Low Point terminal. Changes in air quality at existing terminal sites which would result from the reduction in tanker traffic.
8. The availability of spare capacity in existing connecting pipeline systems (without such capacity TMPL cannot serve Northern Tier states).
9. Effects of secondary petrochemical development in the vicinity of Low Point (the same rationale applies here as at Port Angeles).
10. Effects of runoff water discharges on water quality.

(84) Northwest Energy/Foothills:

1. Air quality effects of the terminal and storage facility in the vicinity of Skagway and on nearby National Parks and National Monuments.

ALTERNATIVE II - Page 4

(84)
2. Marine resources at risk enroute between Valdez and Skagway (exposed to the risk of an oil spill). Describe them, their uses, and their economic values.
3. Navigational safety enroute to Skagway, particularly along the Lynn Canal.
4. In-transit and at berth oil spill risks. Quantification of the impacts of a major spill as well as of chronic spills at the terminal facility.
5. Effects of runoff water discharges on water quality.
6. Risks of fires and explosions. Damages resulting from such events. Possible measures which might be required to reduce those risks and/or prepare to respond to such events. (We assume that Skagway's fire fighting system would need a major expansion in order to be adequately prepared for such events.)
7. Effects of secondary petrochemical development if such development appears reasonably possible. If not, explain how this determination was made (what analysis was performed).
8. Effects of facility construction and operation on Skagway's potable water supplies (principally groundwater) and possible water supply protection measures.
9. The availability of spare capacity in connecting pipelines.

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**87**

Ken Knudson
522 First Street
Helena, MT 59601
Phone: 442-7531
March 29th, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Ore. 97232

Dear People:

I have reviewed the draft Environmental Impact Statement (EIS) prepared by your office and have found it inadequate in several areas:

① (1) Regarding Irretrievable Commitments of Energy Resources -
The Northern Tier Pipeline (NTP) would consume nearly six million KWH of electrical power per day, over twice the average daily energy capacity of Hungary Horse Dam. Montana generating facilities will no doubt have to satisfy at least a portion of this electrical demand. This additional need for power generation, including potential sources or siting of new sources must be related in terms of impacts towards Montana resources. The addition of such a large energy requirement to the Pacific Northwest "power pool" will very likely place an additional demand upon strip mining of coal in Eastern Montana, as well as increase the "need" for additional coal-fired generating plants in our state.

② (2) Regarding Environmental Impacts to Fisheries Resources -
Stream crossings, both large and small during construction of the NTP will cause our State Water Quality Standards for turbidity (sedimentation) to be continually exceeded. Such water quality impacts will, in turn, cause loss of young-of-the-year fish, destruction of fragile aquatic insect food sources and even loss of adult fish because of competition between fish displaced (by sediment) to unimpacted areas of the stream that already have established resident populations. Also, your own projections indicate that pipeline breaks are going to occur, adding the certainty of oil spills as an other significant impact that will occur to Montana's aquatic resources, particularly if the pipeline is allowed to be frequently placed near streams or rivers. The close proximity to streams and the subsequent need for stream crossings could be greatly reduced if the pipeline followed existing rights of way such as major highway networks. Your draft EIS did not address in enough detail the environmental (and perhaps economic) benefits of following such already disrupted rights of way.

③ Also, as far as adequately addressing impacts to aquatic (and terrestrial) wildlife it would seem that any logical review can only occur after selection of the final pipeline route. General impact statements can in no way satisfy the need for evaluations on a site-by-site basis. Hopefully, your final EIS will spell out this most important consideration and, in turn, recommend the need for further site-specific evaluations before granting approval for any phase of construction.

④ (3) Regarding Seismic Activity -
Your draft EIS did discuss in some detail, the earthquake potential existing in the Montana Rockies. As you stated, the potential for significant disruption of the pipeline by earthquakes during the next twenty years is quite high. Is this potential as high with the other three northern pipeline alternative routes? If the potential for disruption by earthquakes is high all along the Rocky Mountains, then perhaps your final EIS should conclude that any West-to-Midwest pipeline is a bad idea.

⑤ (4) Regarding Social Impacts in Montana -
An adequate description of the life styles preferred by a large number of Montanans was not addressed in your draft statement. Many of us prefer the rural, scenic, clean air and water lifestyles that could well be disrupted by the pipeline construction. These impacts both during and after (because of the establishment of a corridor precedent) construction need to be evaluated in your final EIS in terms of the attitudes and feelings of residents in the areas being impacted.

⑥ (5) Regarding the Crude Oil Needs of Montana Refineries -
Montana presently exports well over one half of the crude oil produced in the State. Therefore, even with the discontinuance of Canadian oil shipments in 1982, there would still be an adequate supply for the Billings refineries if proper "paper shuffling" such as regulatory changes and supply trade agreements could be made between states and oil companies. This potential for redistribution of Montana and Wyoming oil must be addressed in your final EIS as a viable alternative to the NTP supplying Montana refineries.

⑦ (6) Regarding Alternatives to the Northern Tier Pipeline -
Although each of the original four "Northern" pipeline alternatives (Numbers 1-4 in your draft EIS, figure 8.4.3.1-1) entail major construction and operating impacts, the "Foothills" proposal certainly has two outstanding environmental (and perhaps economic) benefits, i.e. an already disrupted right of way existing along the Alaska Highway and elimination, or at least reduction of the need for oil tankers, depending upon where the Foothill's Pipeline would originate - near Skagway or Fairbanks (the latter starting point would totally eliminate the need for oil tankers). Elimination of the need for sea-going tankers would also have obvious national defense implications.

⑧ Furthermore, alternative routes, need not be the only considerations in this matter: (a) Reduction in the flow of Alaskan oil to amounts that would be utilized in the West Coast would eliminate the "surplus" of oil in this area. (b) Retrofitting of West Coast Refineries to enable processing of straight, unmixed "sour" Alaska crude would eliminate the need for importation of "sweet" oil mix. (c) Exportation of Alaska crude to Japan in exchange for rights to other oil sources, again essentially "paper shuffling" would eliminate the need for any large West-to-Midwest, so-called "Title V" pipeline.

All of these proposals should also be evaluated in your final EIS as viable alternatives to the Northern Tier Pipeline.

Thank you for your consideration of all of the above concepts in your final EIS.

Sincerely yours,

Ken Knudson

Ken Knudson

cc: Cecil Andrus, Secretary of the Interior
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee

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**88**

STATE NURSERY
TOWNER, NORTH DAKOTA 58788
[illegible]

March 23, 1979

Bureau of Land Management
700 N.E. Multnomah
Suite 1250
Portland, Oregon 97232

Gentlemen:

① It has come to my attention that the Northern Tier Pipeline in passing through north central North Dakota may go through the S.E.¼ of Section 31, Township 157 N., Range 75W. This quarter section of land is owned by the North Dakota Forest Service and is a tree nursery. The nursery contains many underground irrigation lines and numerous single and multi-row shelterbelts. This coupled with the high value per acre of nursery stock should be adequate reason for the pipeline not to cross this property. If you need additional information, please contact me.

Would you also send me a copy of the proposed location of the pipeline in relation to Towner, North Dakota.

Thank you.

Sincerely,

[illegible]
Nursery Manager

[illegible]

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**89**

March 27, 1979
Haines, Alaska

U. S. Department of the Interior,
Bureau of Land Management,
729 Northeast Multnomah,
Portland, Oregon 97232

Re: Comments on Foothills Pipeline Proposal, Skagway, Alaska

Gentlemen:

On behalf of Lynn Canal Conservation, Inc., a conservation organization of Upper Lynn Canal residents, including commercial fishermen, the following comments are made on the above proposal.

① a. It was not possible to adequately evaluate the environmental and socio-economic aspects of the plan, since the consultants' study will not be made available apparently until mid April to BLM and or the public. This report should be an integral part of the proposal, but in this instance appears to be treated as incidental, insofar as the public is concerned.

b. LCC adopts the position of the State of Alaska on the draft statement. Many of the concerns which have not been adequately addressed by Foothills, including but not limited to the matter of cost.

② c. What is the impact on the $5 million a year Lynn Canal salmon fisheries? There is little data available on the effect of a spill in inland waters, containment procedures, liability for damages caused to fisheries and to fishermens' gear by tankers or spills, navigation of 50,000-120,000 dwt tankers in the Canal and other issues.

③ d. There is no evaluation of the data accumulated from the tanker traffic in Lynn Canal during the war years when 15,000 dwt and later 30,000 tankers were used by the military to deliver mixed fuels to upper Lynn Canal, about three times a month. No major spills were recorded, however the use of tugs was found to be necessary and use of Taiya Inlet seemed to be marginal at times during severe storms anchorages. Foothills plans to use tankers of six times the tonnage at a frequency seven times that was evident before in the war and postwar times. What will be the operation plan?

④ e. There is inadequate discussion of the alternatives, especially from the standpoint of the West Coast oil glut. The Skagway proposal seems to be primarily addressed to this problem, which conceivably could be a short run difficulty. One of the prime reasons for an all Alaska pipeline was to avoid the potential problems of having the line in a foreign country. Transshipment of Indonesian oil could be arranged through the Long Beach alternative. It appears that the Skagway line lacks flexibility as well.

⑤ f. The instability of the White Pass location proposed for the line has not been reasonably addressed. It would be unfortunate if the only solution would be to blast a trench out of such much of the way, since above ground placement seems unfeasible due to continuous slide problems.

It would appear that a long term solution would call for a Delta connection along the gas line route in conjunction with use of existing ports along the continental United States for foreign oil shipments. This avoids the use of Southeast Alaska inland waters and the practice of short run construction of pipelines in areas which should not have pipelines. Short of a national emergency, it is difficult to envision the need for tankers in the fishing rich areas of the scenic Panhandle of Alaska.

Very truly yours,

President, L.C.C.

**90**

March 29, 1979

① Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Bldg.
700 N.E. Multnomah
Portland, Ore. 97232

Attn: Ron Sundell

Dear Sir

This letter is a complaint concerning the inadequacy of the "Fire and Explosion Hazards" section of the BLM Northern Tier Pipeline Environmental Statement Draft. Concerning damage resulting from a possible tanker explosion in the harbor of Port Angeles in the BLM study "Fire and Explosion Hazard" Section III, page 19, you give a description of worst probable accident involving a 300,000 DWT crude oil tanker explosion. I'm calling your attention to the map in Section III, page 18. It should be pointed out that directly across the open water from the proposed terminal is the Olympic Memorial Hospital sitting on the bluff. This is the only major hospital on the North Olympic Peninsula and is within one to one and a half miles from the proposed off floating ramp for tankers.

On page 25 of Section III You state that moderate damage would be produced by a 300,000 DWT tanker explosion in the range of from 175 feet to 2250 feet. This is based on hypothesis using a large number of complicated formulas which do not correspond to actual explosion of tankers in the recent past. I would draw attention to comparison of your hypothesized data to the actual explosion of the oil tanker SS Sansinena which occurred in Los Angeles harbor on 12-17-76. Data concerning this report comes from the U.S. Coast Guard report #1672-71895. The SS Sansinena was a 70,000 DWT tanker. The tanker proposed in your worst probable accident hypothesis is a 300,000 DWT tanker. On page 15 and 16 of the Coast Guard report of the explosion of the SS Sansinena it states that heavy damage resulting from this tanker explosion occurred at distances ranging from one and one sixteenth miles to one and one half miles from the site of explosion. It stated that scattered damage which included broken glass occurred as far as three and one sixteenth miles away from the explosion. The SS Sansinena was one fourth to one fifth the size of the tanker hypothesized in your worst probable case. Examples and the actual factual damage as measured by the Coast Guard is two to three times the distance which you state would occur from explosion of a tanker four times as large. There is obviously a serious discrepancy between your hypothesized tanker explosion and what is an historical documented fact.

After reviewing the data on the SS Sansinena explosion and looking at the map of the Port Angeles harbor and the proposed tanker unloading port in relationship to the town and especially in relationship to the community hospital, it is obvious to any logical person that a tanker explosion of the size of 300,000 DWT would cause serious damage and injury and loss of life to a large percentage of the total population of Port Angeles and at the same time would totally incapacitate and damage the only hospital in the area that would

March 29, 1979

Re: Proposed Oil Tanker Dock

serve as emergency service in case of an explosion.

This area of the Northern Tier Evaluation Site needs to be reappraised in terms of: 1) Emergency medical services in the community, 2) Fire and explosion hazards produced by the proposed Oil Port.

I would appreciate an explanation of the discrepancy between the historic facts of a relatively small oil tanker explosion, the SS Sansinena, and your proposed damage of an oil tanker explosion in Port Angeles harbor.

Sincerely yours

John R. Mather

cc: Congressman Ronald Bonker, Senator Henry Jackson, Senator Warren Magnuson, The State Energy Site Evaluation Counsel, Director Nick Lewis.

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**91**

Larry G. Peterman
446 Russell Lane
Helena, Montana 59601
Phone: (406) 442-2103
March 29, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Sir,

I wish to comment on the adequacy of the draft EIS as it concerns the preferred routing of the Northern Tier crude oil pipeline. I am concerned with that portion of the pipeline routing in Montana east of MacDonald pass that runs directly through the Helena valley. The proposed route runs just north of Custer avenue along the north edge of Helena and through the Helena valley. As a resident of the immediate area, I am deeply concerned with the probable impacts associated with the proposed routing.

Upon examination of the draft EIS issued by the Bureau of Land Management, several significant items were discovered. These are outlined below:

1. The proposed Northern Tier Pipeline is a 42 inch diameter pipeline with a maximum capacity of 709,000 barrels of crude oil per day (Draft EIS Summary, page 15).

2. A leak too small to be detected by remote sensing equipment could amount to as much as 3,540 barrels per day at maximum pipeline capacity (Draft EIS, chapter 3, page 65).

3. Soil contamination from this type of leak would continue until it was detected visually and stopped (Draft EIS, chapter 3, page 65).

4. Helena is located in Seismic Risk Zone 3, the highest risk zone for earthquake activity along the entire pipeline route (Map Addendum to Draft EIS, page 5).

5. The pipeline crosses the Prickly Pear Fault, an active earthquake fault (Draft EIS, chapter 3, page 60).

6. Two earthquakes (magnitude 6.0 and 6.25 Richter) have occurred on this fault within the past 50 years (Draft EIS, chapter 3, page 61).

7. The potential for an oil spill resulting from pipeline rupture in the vicinity of this fault would be high (Draft EIS, chapter 3, page 61).

A significant portion of the residents in the immediate vicinity of the pipeline and most, if not all, residents north of the proposed pipeline route depend on wells for water and septic tanks for waste treatment. The impacts of a rupture of a major crude oil pipeline or a chronic, undetected leak in the residential Helena valley are frightening.

In view of the acknowledged seismic activity in the area, the probability of a pipeline break due to earthquake activity in the area and the possibility of a large undetected leak, I feel the draft EIS has been grossly inadequate in addressing the possible impacts of Northern Tier to the Helena valley. More specifically, the draft EIS has failed to address:

① 1. the impacts associated with the proposed routing through the residential Helena valley.

② 2. the impacts of an undetected leak on the groundwater of the Helena valley.

3. the amount of oil required to produce significant contamination of the groundwater.

4. the effect of a contaminated groundwater supply on residential wells and septic tanks in the area.

5. the length of time the groundwater would remain contaminated in the event of a leak or spill.

③ 6. the economic impacts of an oil spill on residents of Helena and the Helena valley.

④ It is probable that a relatively small leak undetected for a period of time could significantly contaminate groundwater sources and adversely affect residential areas in the Helena Valley. In addition, the extensive network of irrigation canals throughout the valley may provide for rapid and widespread dispersal of an oil spill, should one occur in the vicinity of a major canal. This aspect also has not been addressed in the Draft EIS.

In view of the serious implications of routing the Northern Tier pipeline through the Helena valley, I feel a major analysis of impacts is warranted and must take place before this particular segment of the route receives further consideration. Thank you for considering these comments in the final EIS.

Sincerely,

Larry G Peterman

Larry G. Peterman

cc: Cecil Andrus, Secretary of the Interior
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee

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**92**

March 29, 1979

Northern Tier Project
Bureau of Land Management
Room 1250, Lloyd Bldg.
700 NE Multnomah
Portland, OR 97232

Dear pipeline EIS writers:

Although I haven't been able to carefully read the entire draft EIS prepared by you on the Northern Tier Pipeline, I have casually reviewed it and talked to several knowledge people in the energy field. With that in mind, I'd like to offer the following general points.

① 1. The real need for the pipeline isn't adequately addressed. When one considers the potential for energy conservation in this country, we probably didn't need the Alaska pipeline, let alone the Northern Tier. Top this off with the tremendous amount of energy needed to transport the oil from the well head, it's totally ridiculous.

2. The potential for a 3540-barrel-per-day leak that can go undetected is criminal. This could destroy ground water and drinking water, stream ecology, and irrigation systems. The pipeline route passes through several such areas where this would be a threat.

② 3. The pipeline will foster heavy industrial growth along its path. This impact isn't adequately addressed and when it is, the environmental impact will be clearly drastic.

As I'm sure you can tell from the above, I'm completely against the Northern Tier pipeline. It's not a matter of which route. The only sane answer is to not build it at all.

Sincerely,

Bill Schneider

Bill Schneider, 157 Fairway Drive, Helena, MT 59601

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**93**

FRIENDS OF THE EARTH

Northwest Office
4512 University Way NE
Seattle, Washington 98105
[illegible]

March 28, 1979

Murl W. Storms
Oregon State Director
Bureau of Land Management
U.S. Department of the Interior
Northern Tier Project
Room 1250, Lloyd Building
700 NE Multnomah
Portland, Oregon 97232

re: Draft Environmental Impact Statement,
Transportation System Port Angeles,
Washington to Clearbrook, Minnesota
(Northern Tier Pipeline Company)

Dear Mr. Storms:

These comments on the Draft Environmental Impact Statement (DEIS) concerning the proposed Northern Tier Pipeline are submitted by the Northwest Office of Friends of the Earth, a national citizen's environmental organization with 24,000 members. There are 1,200 members in Washington State and many others in other states that will be directly impacted by the proposed construction project. Additional comments on the DEIS may be submitted by other offices of Friends of the Earth.

Friends of the Earth has carefully examined the DEIS and believes that it is seriously deficient in its discussion of the proposed project, the environmental damage which it will inflict, and the alternatives which are available. The following comments are keyed to particular pages of the DEIS and they are also relevant to other similar discussions in the DEIS who's pages are not specifically cited.

① Page 1-11 of the DEIS purports to describe the construction and placement of the underwater pipeline. This description is wholly inadequate. No information is given concerning the method by which the pipeline is to be placed in position beneath the water. No information is given concerning how the pipeline would

Page 2
Murl Storms
28 March 1979

be "buried beneath the harbor bottom" or what means would be used to keep it there. Similarly, the DEIS merely states that the pipeline would be buried at "sufficient depths to minimize the possibility of ships' anchor damage," but does not specify what that depth is. Without this information it is impossible to comment on the proposal adequacy of its environmentally possessive measures since pertinent facts concerning the proposal have not been disclosed. Similarly, the description on page 1-11 of pipeline shutdown in response indications of a leak does not describe in sufficient detail how that shutdown would occur. There is some indication that a leak would precipitate the procedure in which the oil in the line would be replaced with water, but no information is given concerning where or how the displaced oil would be discharged. Finally, if the description of the Submarine Pipeline on page 1-11 is meant to indicate that it would be "thick-walled pipe" consisting of only one wall this raises serious questions about the safety and the environmental soundness of the entire Northern Tier Pipeline Proposal.

② Page 1-55 of the DEIS discusses the so called "minor spills" and asserts that such spills "generally cause minimal impacts." This statement and the entire DEIS's discussion of minor spills are seriously deficient in that it fails to address adequately the severe adverse cumulative effects which minor spills may cause over a period of time. Moreover there is a serious question not adequately addressed by the DEIS concerning the effectiveness of current methods for detecting minor spills and, more importantly for rectifying them once they are detected. Since the DEIS itself concedes that minor spills may occur more frequently than so called major spills, the cumulative effects of such minor spills and the means by which they are to be prevented or corrected must be discussed in more detail.

③ Page 1-57 of the DEIS suggests that the reduction of air pollution while tankers are in port may be accomplished in part by requiring that arriving tankers utilize only "locally supplied fuel of 1 percent sulfur content (currently available)." However the DEIS does not state how this requirement will be enforced. Moreover, there are serious questions not addressed in the DEIS, concerning whether such fuel will be available for arriving tankers. Obviously unavailability of such fuel will preclude the litigation which the DEIS contemplates and therefore this possibility should be discussed. In general, all the "additional

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④ measures proposed for environmental protection" cited on pages 1-56 thru 1-58 are given only cursory attention and should be addressed in greater detail in the Final Environmental Impact Statement (FEIS) particularly in regards to how they will be enforced and their potential effectiveness.

⑤ Page 1-59 contains a discussion of interrelationships of the Northern Tier Pipeline Proposal with the mandates and programs of various federal agencies. It asserts that, "there would be no significant effects on endangered or threatened marine mamals so the National Marine Fisheries service has not been consulted." However, because the National Marine Fisheries Service, component agency of the National Oceanic and Atmosperic Administration, has jurisdiction over salmon and other fisheries, this agency clearly should have been consulted concerning the potential effects of the Northern Tier Pipeline Proposal on fisheries. Failure to do so constitutes a serious defect in preparation of the DEIS and must be remedied before it is issued in final form. Moreover, the conclusions that there would be no serious effect on endangered or threatened marine mamals is one which should have been appropriately made by the agency having jurisdiction over them rather than by the project proponent.

⑥ The discussion of social and economic conditions on page 2-46 of the draft statement underestimates the nature and depth of local opposition to the proposed oil port. Moreover, statements are made concerning desirability, for example, of a more diversified industrial base without making clear rather such statements are attributed to area residents or to the project proponents.

⑦ In general, the draft statement discussion of environmental impacts is deficient in every respect. For example, discussion of adverse air quality impacts is based on questionable modeling assumptions. Even so, the DEIS concedes that platform standards for Olympic National Park would be exceeded, it fails to adequately address implications of such degraded air quality for the national park and the surrounding areas. Similarly the
⑧ DEIS discussion of spill risks fail to present a realistic analysis of frequency with which spill risks incidents may occur and individual or cumulative effect which such spills may have on the environment.

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⑨ The draft is particularly unrealistic in its assertion without logical support that(page 3-40) it is likely that oil storage facility would remain a single industrial use and that no development would occur nearby. This assumption which is pivotal to consideration of land use impacts by the proposed project and which is of vital concern to the surrounding community should be addressed in more detail. In particular, detailed attention should be given to the possibility that the project will foster development of a petrochemical industry in the area. ⑩ Similarily, the effect of tanker queuing, discussed on the draft page 3-42, and the expected huge increase in port traffic should be examined from all perspectives including air quality, water quality and effect on other local industries which now rely on use and access to port facilities. ⑪ Safety considerations are also slighted in the DEIS including the consideration of danger and impact of fire or explosion on the surrounding area. Thus the statement on page 3-51 that additional independent anayses of fire or explosion are being conducted and are being incorporated into the FEIS fails to provide those reviewing the DEIS with adequate information on which to base their comments.

⑫ The failure of the draft statement to identify mitigating measures with regards to air quality (page 4-2) emphasizes the inadvisability of proceeding with the proposal at all since adverse environmental impacts on air quality promise to be severe. Other possible mitigating measures connected with particular potential adverse impacts are odd. For example the statement suggests that (page 4-3) once submarine pipelines were laid they might be designated as a "no anchor zone" by the Coast Guard. However it is conceded that the Coast Guard may not commit itself to this mitigating measure until after the pipeline has been laid and the proponent is committed to construction of the project.

⑬ In summary, Friends of the Earth beleives that the DEIS is inadequate as an "Environmental Full Disclosure" document designed to form decision makers of the potential adverse environmental impacts and consequences of a proposal. The serious deficiencies evident in the DEIS are reason enough to require a rethinking of the entire project and repreparation of the DEIS. Moreover, the existence of studies recently made public which demonstrate that the Northern Tier Pipeline may not be needed at all calle

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into question the entire premise which the DEIS is based on and specifically raises doubts about whether the draft statement adequately considers alternatives to the Northern Tier Pipeline Proposal. Thus at a minimum, the DEIS should be withdrawn and ammended to reflect consideration of these new studies as they relate to the Northern Tier Pipeline. The Northwest Office of Friends of the Earth continues to believe that a properly prepared DEIS incorporating all available information and involving consultation with all concerned agencies would clearly demonstrate the inadvisability of proceeding with the Northern Tier Pipeline Project. We will therefore continue to monitor the project proposal closely.

Sincerely,

Dale Jones
Dale Jones
Northwest Representative

cc: Senator Henry M. Jackson
Senator Warren G. Magnuson
Congressman Joel Pritchard
Congressman Don L. Bonker
Congressman Mike McCormack
Congressman Thomas S. Foley
Congressman Mike Lowry
Jack B. Robertson, Department of Energy, Seattle
R. Kahler Martinson, U.S. Fish & Wildlife Service, Portland
Regional Administrator, NOAA, Seattle
Donald P. Dublis, Regional Administrator, EPA, Seattle
Selected Conservation Leaders

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**94**

Minnesota
Department of Transportation
Transportation Building
St. Paul, Minnesota 55155

March 26, 1979

Murl Storms
State Director
Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Mr. Storms:

The Minnesota Department of Transportation (Mn/DOT) has reviewed the Draft EIS prepared for Northern Tier Pipeline. We offer the following comments for your consideration.

① 1. The Draft EIS acknowledges that Minnesota Trunk Highways No.'s 220, 2, 75, 32, 59, and 92 will be affected by the pipeline construction. The report also identifies that roadbeds crossed by the pipeline will be augered or bored and casing supplied in accordance with Minnesota requirements. Each of these road crossings will require Mn/DOT permits.

The report further indicates that during construction, pipe will be stockpiled at Crookston, Dugdale, and Fosston. It is proposed that pipe from the yards will be transported to construction sites in 40 to 80 foot lengths. The transportation of the pipe would affect traffic on each of the referenced highways and would require extra length permits from our Department for each load if the 80 foot lengths are transported.

② 2. Page 1-21 identifies a State Highway 12 in Red Lake County. This reference should be changed to County State-Aid Highway (CSAH) 12.

3. Page 2-129 references Minnesota Highway 20. This reference should be changed to Minnesota Trunk Highway 220.

③ 4. Our Department has concerns relating to the possible effects the transportation of pipeline equipment may have on the trunk highway system. Extremely heavy loads can damage roadbeds. Of the trunk highways identified in the Draft EIS, several roadways have spring load restrictions and/or year round bridge weight limitations, which could influence pipeline construction. Both Trunk Highway 2 and 75 are year round, 9-ton

Page 2
Mr. Storms
March 26, 1979

roads. For information on other road or bridge limitations, pipeline representatives may contact Patrick Hughes, Area Maintenance Engineer at Mn/DOT's Bemidji Office at (218) 755-3305.

④ 5. Our Department's Aeronautic Division has some concerns about the proximity of the proposed pipeline to the Crookston Minnesota Municipal Airport. This concern is prompted in part by the fact that neither the text of the EIS nor the associated graphics clearly define the pipeline route in relation to the Crookston Airport.

Our chief concern is that the City of Crookston is proposing an airport expansion project. Depending upon the pipeline route, there could be conflicts between the airport and the pipeline.

Another major concern is aviation safety. If pipeline construction takes place in the approach zones to the runways, the construction equipment could become a temporary obstruction. As such, if construction is to take place near the airport, we would appreciate your notifying Richard Thiesen, from our Aeronautic Division, at (612) 296-2552 so that the contractor may be advised on precautions to be taken in the approach zones.

Thank you for the opportunity to review this Draft EIS. Questions on the above comments may be directed to Randy Halvorson, Acting Director of the Office of Environmental Affairs at (612) 296-1623.

Sincerely,

Richard P. Braun
Commissioner

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Environmental Information Center Box 1184, Helena, MT 59601 (406) 443-2520
Box 8166 Missoula, Mt 59807 (406) 728-2644

March 29, 1979

BLM- Northern Tier Project
Rm. 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear sirs:

This is written testimony which I am submitting to supplement our oral presentation on March 8th at the Missoula hearing on the Northern Tier Draft Environmental Statement. Do not hesitate to contact our office if we may provide any additional information. Thank you.

Sincerely,
A. Peter Funk
A. Peter Funk
Missoula Staff Representative

Testimony Presented to the Bureau of Land Management Concerning the Draft Environmental Impact Statement on the Northern Tier Pipeline Project

Presented at Missoula Public Hearing
March 8, 1979

My name is Peter Funk and I represent the Environmental Information Center. Our organization will be submitting written testimony to suppliment the views expressed today, before the April 2nd deadline. E.I.C. is a Montana grass-roots citizen's organization which has an interest in a wide range of issues affecting the quality of life in our state. I am here today to express some concerns addressed to the B.L.M.'s draft statement: concerns raised both within E.I.C. and by Montana citizens not affiliated with our organization.

The Northern Tier Pipeline is proposed to solve a two-fold problem. A projected crude oil shortfall in the Northern Tier states and a surplus of Alaskan crude oil on the west coast. In the description of the proposal, all figures relating to projected supply and demand in the Northern Tier states have been supplied by oil companies or their consutant firms. ① It is our view that independent data should be used if available, or generated if not presently available, to evaluate this estimated "shortfall" in the Nortern Tier states. This need for independent data is particularly apparent in light of the fact that in the early 1970's, oil company investors in the Trans-Alaska pipeline system testified before Congress that their data indicated the Alaskan Pipeline would not create a surplus of oil on the west coast. 1.

We are now presented with a project to alleviate this surplus; a problem the American people were assured would not exist in the first place. The federal draft statement should not rely on data from sources which have been shown to be inaccurate in the past.

In regard to the elimination of this surplus by the Northern Tier project, the figures contained in the description of the proposal generate concerns that the proposed pipeline's capacity at the peak operating stages would only handle the PRESENT surplus of Alaskan crude oil. Yet by 1985, the increased production of ② Alaskan oil is expected to generate an additional quantity of this crude.[2.] The Northern Tier project's apparent inability to deal with this future supply should be more fully explored in the draft statement.

A further indication of need for the project would be the ③ existence of contractual agreements between the Northern Tier Company and crude oil owners,guaranteeing that there will be a product to fill this pipeline. Such contractual agreements are not mentioned in the draft statement, and should be included in any proper evaluation of the Northern Tier project.

CONT

The document projects a shortfall of crude for Montana, resulting from the cutback of Canadian oil supplies. However, Montana and Wyoming produce enough oil to meet state demands.[3.] This oil is not marketed here presently, but rather exported to other regions because of existing contracts which prohibit the redirection or discontinuance of pipeline deliveries, once ④ established. The draft statement on Northern Tier fails to explore the alternative possibility of redistribution of Montana and Wyoming produced crude, and it's effect on the projected shortfall within these states.

Citizens have also objected to the range of proposed ⑤ alternatives discussed in the statement. The federal draft statement does not address the following alternatives:

1. reducing the flow of the Trans-Alaskan pipeline system to the amount that could be utilized on the west coast.
2. retrofitting of west coast refineries to enable processing of Alaskan oil.
3. the export of Alaskan crude to Japan.

Many residents of Montana feel such alternatives should be explored fully in this type of decision-making document.

⑥ A further state issue concerns the Montana Major Facilities Siting Act. This law is not addressed(or even mentioned) in the list of applicable laws in the B.L.M.'s document.[4.] This has been a clearly expressed concern of Montanans on the draft statement. If the Northern Tier pipeline project is exempt from this law, specific reasons for this exemption should be clearly states.

⑦ Criticism of the assessment of social impacts have centered around the lack of site-specific data. The diversity of the social resource is not shown in the present evaluation.[5.] Impacts of the proposed project will differ greatly on varying Montana social environments. In other words, the same social impacts may not be felt,for example, in the Nine Mile Valley west of Missoula as would be experienced by communities in other areas of our state. Furthermore, the FEELINGS of citizens in the impacted areas should be detailed in the Northern Tier environmental statement.

⑧ Economic benefits in the form of local tax revenues should be analysed more fully. Tax benefits are represented only as a total amount of tax paid to each county.[6.] This does not give Montanans the information to evaluate the economic impact on themselves as individuals. A much more specific breakdown of tax benefits should be included in the final statement.

⑨ No alternatives to the Northern Tier proposal for mitigating social impacts are included in the draft statement.[7.] Northern Tier proposes only to aid localities in applying for government funds to reduce such impacts as road damage, recreation facility strain, difficulties for local business in coping with rapidly changing markets and many other potential impacts. Some discussion of alternative and more effective mitigating measures that have been used in the past on similar projects must be included.

Several inadequacies in the environmental impacts section have also been discussed by citizens.

⑩ Rural residents have expressed concerns over the disruption of shallow or "perched" water tables, many of which are important sources of supply for people, livestock and wildlife. A discussion of the impacts on these resources from the proposed project is not included in the draft and should be fully investigated before the final statement is released.

⑪ Potential oil spills along the route are worrying many. The draft statement gives no adequate justification that Northern Tier's leak detection system is, in the B.L.M.'s words,"state of the art". Surely alternatives must exist to this "state of the art" system, which admittedly could not detect a leak of over 3,000 bl./day of crude oil into our Montana environment.[8.] Justification must be given that this system is the most effective that now exists, technologically, at detecting pipeline leaks.

95 CONT

11 There is also no detailed plan provided by the Northern Tier Company for oil containment and clean-up procedures in the event of a leak. Such a plan must be included in the evaluation of any oil transportation system.

12 No measures have been discussed in the plan to offset the likelyhood of surface water degradation from hydrostatic testing of the pipeline. Northern Tier may add soda ash and bacteriological agents to the test water. The draft statement finds no problems with DIRECT RETURN of this possibly contaminated test water to Montana's streams. Montanans will not accept the assumption that this test water will not degrade the existing aquatic resource. Proof must be shown that the proposed method of returning this water to our streams and rivers will not adversely affect the quality of those waters.

13 The creation of an uninterrupted corridor the entire length of the pipeline route has raised many questions concerning the environment. The possibility of off-road vehicle use on such a corridor is a concern of landowners. Increased access for illegal poaching could adversely impact our big game resource. These questions are not dealt with in any detail.

14 Also in regard to the corridor, the Minerals Leasing Act of 1920 specifies that pipeline corridors shall not exceed 50 feet in width (plus the diameter of the pipe). The draft statement does not explain why the Northern Tier Company can request a permanent 75 ft. right-of-way. It is also the stated policy of the Montana Board of Natural Resources and federal law to require new construction of energy transmission facilities to be located within existing energy corridors. There is no discussion of the future impacts of other energy systems being placed within the Northern Tier corridor. An evaluation of such possible future development must be included.

15 A final area of inadequacy in the draft statement reflects the demand for energy which the pipeline will create within Montana. The Northern Tier proposal will demand 5.6 million KWH of electricity per day, or roughly twice as much as the total daily output of Montana's Hungry Horse Dam.[9] What will be the consequences of this large increase in demand for electrical power? Will we in Montana have our quality of life lessened because of this new demand? Data is not provided to answer these questions in the draft and this is a serious omission, particularly for Montanans.

In summary, it is our view that this document does not independently establish a need for this project. There are some choices, that many feel are valid alternatives to the Northern Tier pipeline, which are not investigated. The non-specific nature of the data in regardto social and environmental impacts, and the insufficient questioning of measures proposed to mitigate those impacts, are serious problems in this document, for all citizens. No matter what one's particular opinions are on this project, the draft statement as presented can not be used as the basis for a sound evaluation of a project of this magnitude. Thank You.

REFERENCES

1. Congressional Hearing transcripts. Trans-Alaskan Pipeline hearings. 1973.
2. Science. Pipeline problems exacerbate west coast oil surplus. vol. 201. August 18,1978
3. Federal Energy Administration. Petroleum Supply Alternatives for the Northern Tier States through 1980. June 1977.
4. Bureau of Land Management. Draft Environmental Impact Statement-Northern Tier Project. January, 1979. p.1-5.
5. Ibid. p.3-112 through 3-125.
6. Ibid. p.3-126
7. Ibid. p.4-8
8. Ibid. p.3-65
9. Ibid. p.1-32(computed from figures found on this page).

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Northern Tier Project
Room 1250 Lloyd Building
700 N.E. Multnomah
Portland, Or. 97232

I want to express my strong opposition to the proposed route of the N.T.P. commonly referred to as the Avenue to Helmville Route. As a resident of the Helmville Valley for the last [illegible] years, I [illegible], [illegible] impact [illegible].

This valley provides wintering grounds for many endangered and [illegible] species [illegible] heron, osprey, sandhill crane, & the bald & golden eagles as well. The habitat here is ideally suited [illegible] would suffer if this pipeline becomes a reality.

Many residents of this valley came to live here because of the [illegible] & the small population. Our

[illegible] aren't large enough to accommodate a large [illegible] increase in [illegible]. Our [illegible] aren't equipped to handle a large volume increase. The road conditions of this area aren't suitable for heavy construction equipment hauling.

If the NTP must be constructed then I firmly believe the use of existing corridors as established by the Minerals Leasing Act of 1920 to be the best choice!

I must [illegible] a sensible approach to the energy problems of this country would be the devotion of more time & money toward alternative energy solutions that do not cause long term environmental, social, & economic damage to our area.

Sincerely,

[illegible]
Box 76
Helmville, Mt. 59843

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97

March 30, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

We are deeply concerned with the threat of Northern Tier Pipeline and hope that some action can be taken against it going through

Besides the ecological and biological affects, we are concerned with the social & economical drains and taxes it will put on this area

If there is anything we can do to prevent such a pipeline, please let us know

Mr & Mrs. Larry L Owen
Box 1134
Thompson Falls, Montana 59873

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98

Dear sirs of the BLM:

We believe it is totally absurd to assume that Montanans are so gullible and naive as to accept the Draft Environmental Statement as it now reads.

First of all it appears that the Northern Tier Pipeline is, in fact, an extention of the Trans-Alaskan Pipeline.

We believe that the oil companies lied to the American public when they so cleverly assured us that there would be no surplus oil on the west coast if the pipeline was allowed to be built.

But, the fact is, that is approximently 600,000 bbl/day of surplus oil and also that there is 616,000 bbl of oil a day of foreign imported oil

The Northern Tier will cost, according to the May, 1978 calculations, $1.15 billion to build.

We suggest that the oil companies put this money where it will be most beneficial to the American public, not the bureaucratic monopolies.

1 We suggest that this money be spent on the retro-fitting of the oil refineries already on the west coast, so as they could utilize and refine the Alaskan sour crude oil.

This alternative has been entirely ignored by the impact statement.

CONT

We feel that the Northern Tier is under obligation to make some kind of justification for this oversight.

The public has also been informed by Northern Tier that no additional demands of burdens would be placed on Montana's Montana's hydro-electric situation.

The Northern Tier will take approximently 500,000 KWH/day which is almost double of what the Hungry Horse Dam produces in one day.

Are we in Montana really supposed to believe that there will be no additional demands put upon us.

2 No where in the DES is there any mention of Eminent Domain.

This pipeline is considered a common-carrier, but again no mention has been made of it

Some justification must be made for such a grave error on the part of Northern Tier.

Are Montanans to stand by and watch ranch after ranch be condemned so as to fatten the purse of the already obese oil companies.

It seems very strange, indeed, that a critical oil crisis occurs ~~[illegible]~~ everytime the oil companies need a pipeline built.

Water in Montana means life. Water cannot be misused or abused.

3 The Northern Tier will be hydro-static tested which will put a crucial demand on our water resources

Also the discharge from the hydro-static testing must be dealt with.

Soda ash and other biological detergents, which have not yet been properly named, will have to be disposed of.

We want to know when this will take place and how.

4 One very important factor is the ever-changing pipeline route. The DES covers only the original route and none of the alternates.

We do not feel there has been sufficient time and effort put into this category.

Also Northern Tier has been so gracious as to offer help in obtaining federal aid for ranchers for the reformation of the land after the pipeline has been built.

Northern Tier's graciousness has hit the U.S. citizen in the pocket book.

We feel Northern Tier is solely responsible for the reformation since they will be doing the devastation.

Federal aid comes from the tax payers, not oil company benefactors, so don't do us any favors Northern Tier.

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CONT

Northern Tier has also said that minimum damage would be done to our river systems, including our fish and wildlife food.

Eleven crossings have been cited in the DES of the Clark Fork River alone.

With such a wide spread siltating problem how can Northern Tier still only assume minimum damage.

We do not believe this to be a very objective or reliable view.

After all the data compiled on the Alaskan pipeline we feel it would be very beneficial for BLM to take a hard look at the facts.

In conclusion, we in Montana feel the pipe line would be, too, devastating to our environment and way of life to accept it as suitable recommendation.

And we also feel that a temporary pipeline of 20 years is not the answer for the long term energy crises ~~solution~~ situation.

As U.S. citizens we feel that the oil companies should look for an entirely new alternative, not an alternate route.

We do not believe any state should have to cope with any problems inflicted by the Northern Tier.

We ask that this testimony, in its entirety be submitted into the BLM files.

Yours truly;
Bruce F. Roths
Rebecca E. Roths

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**99**

PHILIP K. JACKSON, Manager

PUBLIC UTILITY DISTRICT
OF CLALLAM COUNTY

P.O. Box 891
PORT ANGELES, WASH. 98362
Phone 452-9771

BOARD OF COMMISSIONERS
William McCrorie, President
A. E. Fletcher, Vice President
Russell Barton, Secretary

March 30, 1979

① Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Gentlemen: RE: NORTHERN TIER PIPELINE PROPOSAL

We have selected two issues concerning the Northern Tier Pipeline Proposal which we feel have the greatest potential for adversely impacting our electrical and water customers.

The electrical energy issue deals with the availability of power to existing industrial, commercial, and residential customers if, during a power shortage, Northern Tier's facilities are exempt from curtailment proceedings.

The District's concern is that the pipeline system, with it's large statewide energy requirements, would accelerate the rate at which the curtailment plan is implemented. Its energy requirements, when added to the rising regional load and burdened by slippage of forecasted operational dates of the WPPSS nuclear power projects, may tend to raise the probability of curtailment procedures during "critical" water years. Added to this is the current BPA allocation formula which after July 1, 1983, will limit this District's firm power allocation to 103 percent of an estimated load for that year as it was forecasted in 1973. Since Northern Tier's proposal did not exist in 1973, neither did its expected large energy requirements. Therefore, this District's estimated loads during the pipeline's operational years will probably fall short of the actual loads by large quantities.

As a result, District customers who do not share the exempt status with a crude oil pipeline system may have to curtail their usage to a greater degree than, other factors remaining the same, they would if the pipeline system was not built.

The other major issue concerns a District-owned water system and Northern Tier's proposed activity at Green Point. Their present plan calls for a deep trench to be dug there to allow the two submarine lines to gradually ascend the steep bluff. If this were allowed, the trench would cut into the aquifer that supplies the existing Bluffs Well and Pumping Station which serves approximately sixty residential customers. This, in turn, would very possibly lower the Well's static water level and bring about salt water intrusion.

Another concern is that normal operational wastes such as oil sludge, or oil from an oil spill will infiltrate our well since, when pumping, seventy-five (75) percent of the water comes from the strait side and twenty-five (25) percent comes from the mountain side.

Also, if Northern Tier plans to pump from wells at the Green Point site they must prove by testing that they will not affect the capability of the Bluff's Well. Any further drawdown of the aquifer than what is being experienced now will have drastic impacts on the existing well.

In summary, the District needs to be assured that the proposed Northern Tier Pipeline System will neither jeopardize the availability of energy to our electrical customers nor adversely impact the water quality or its availability to our Bluff's Well customers.

Sincerely,

John C. Tolan
John C. Tolan

Administrative Aide

JCT/je

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**101**

March 30, 1979
P. O. Box 839
North Bend WA 98045

Bureau of Land Management
Northern Tier Project
Room 1250 Lloyd Bldg.
700 NE Multnomah St.
Portland OR 97232

The draft Environmental Statement for the Northern Tier Project is a deficient description of the planned route. In an attempt to describe all possible alternatives (across Puget Sound, around Puget Sound, etc.), no one has been specifically proposed and completely examined.

The ES does not specifically address:

① 1. The economic issues. The economic justification provided is extremely shallow. The pipeline capacity is not compatible with the oil resource requirements of the intended market. The ability of the refineries in the Midwest to process the Alaska oil is not examined. The ultimate cost to the consumer of the oil products is not considered, especially in comparison to other alternatives supply methods.

② 2. The effect on marine resources. The immediate and long-term effects of the pipeline and construction on salmon spawning areas is not dealt with in the serious manner required by the importance of the fishing industry to the Puget Sound economy. The effects and measures of handling oil spills is not described.

③ 3. The effect on the Snoqualmie Valley. The ES does not make an attempt to enumerate and describe the means of bringing the pipeline through the Snoqualmie Valley. There is no discussion of the North Bend oil storage facility proposal. This facility must be viewed with regards to impact on the area including agriculture, the timber industry, local water supplies, pollution, and security (including fire danger).

④ 4. The impact on landowners in the proposed route(s). It is difficult to specifically identify the route with the limited information provided to the public. The cavalier disposition of the interests of the individual landowners is unacceptable.

In summary, the ES does not identify a specific plan for the Northern Tier Project, justify that plan and, within that justification, concisely describe the total impact on Western Washington and specific measures to be taken to mitigate that negative impact. The ES should be extensively revised to adequately address the described deficiencies.

These comments are provided in addition to the testimony given at the March 14, 1979 hearing on the ES.

I would appreciate receiving adequate notice of any further hearings on the subject and copies of the revised ES when it is available.

Maureen P. Swanson

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Star Route Potomac
Bonner, Montana 59823
March 30, 1979

Bureau of Land Management
NORTHERN TIER PROJECT
Room 1250, Lloyd Building
700 NE Multnomah
Portland, OR 97232

Gentlemen:

Attached is a self-explanatory comment for inclusion in the NTPC hearing record.

Please add my name to any list of persons to receive mailings on this matter, in order that I may pass on information to interested persons in this area.

Thank you for your courtesy.

Very truly yours,

Gardner Cromwell

Attachment

COMMENT ON NORTHERN TIER PIPELINE PROJECT

The undersigned, some of the residents and landowners in the Blackfoot River valley, east of Missoula, Montana, offer comment on the draft environmental statement issued by BLM on January 11, 1979, which was the subject of a public hearing in Missoula on March 8.

First, a statement on what this comment is not about:

1. It is not an endorsement of the Northern Tier Pipeline project. Some of the signers are not persuaded by the public evidence of the need for the project.

2. It is not an endorsement of the "route segment alternative" passing through the Blackfoot River valley. At least some of the signers hold the opinion that other alternative routes would cause less environmental impact.

The comment is about matters which the signers believe should govern the choice of route if the Blackfoot segment alternative becomes final.

The Blackfoot River valley is relatively narrow and is traversed by the river and other streams. The small amount of good bottom land available is devoted to growing grain and raising stock. Accordingly, we offer these suggestions for route location:

1. Do not parallel rivers.
2. Do not occupy bottomland or high-yield timber areas.
3. Pursue high ground and ridges wherever possible.
4. Employ the existing Montana Power Co. high-voltage easement passing along high ground south of the river until it reaches the head of Ten Mile Creek in Section 15. Then proceed southwest on a ridge to a point about one-half mile west of the junction of Bear Gulch and the Clark Fork River, from where the pipeline could proceed to the existing corridor.
5. Avoid big game winter range.

In addition, because all water resources serve either domestic or agricultural needs, extreme care should be taken in all stream crossings. All river crossings should be overhead.

Finally, the signers urge that the NTPC spill control program be required to provide remedies for private property damage and contamination of water resources.

Gardner Cromwell
Leonard Iverson
Susan M. Lindbergh
Lucille M. Hall
Verla Mae Will
Nancy Ross Cromwell

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Margaret H. Wright
3017 Creekwood Road
Missoula, Montana 59801
30 March 1979

BLM - Northern Tier Project
Rm 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Sir or Madam:

A study of the Summary Draft Environmental Statement for the Northern Tier Pipeline leaves us concerned that the economic, social and environmental effects are not adequately addressed.

① The very real possibility of oil spills is admitted but we do not see a description of adequate means to detect leaks nor to mitigate their very serious effects on ground and surface water. Many other unfortunate results of such a major project on landowners, communities, wildlife habitats, forest ecosystems are apparent and most disturbing.

We are not convinced of the need for this pipeline. Oil production in Northern Canada is increasing, and also in Northeast Montana. Other alternatives besides this huge pipeline extending twice as far as the Alaska line over fault zones, mountains and clear water streams, should be carefully considered before such an environmentally devastating project is undertaken.

Yours truly,

Margaret H. Wright
Philip L. Wright
Margaret H. Wright
Philip L. Wright

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Page 1 of 3

Garfield - McCone Legislative Association
Circle, Montana 59215
Phone (406) 485-2221

Testimony - Northern Tier Pipeline by Glen C. Childers, March 15, 1979

To: Bureau of Land Management, Portland, Oregon

We are experiencing today, what might be a truly uncommon development in all of human history. It has to do with the capture of the wealth-generating machine of society-- what we call the economy today-- by people who want to turn it off. The "spoils system", the practice of a political party after a victorious campaign. There are people around today, who want to slow down the wealth-generating machine of society, the economy, for reasons based no less on myth and superstition, than the religious fanatics of another time. These people have been around in great numbers since the 1960's, but only now the "spoils system" is operating to bring them to the seat of power. Like most zealots, they are in almost continual revolt. True believers all, they refuse to notice any person or opinion, which does not conform with theirs. What I don't like is that they are forcing us into their political corner by creating a situation of economic chaos, by stopping every energy operation in sight-- they have created an economic time-bomb that is already ticking away-- irreversibly. The "spoils system"-- Conventional means to meet energy demands, are discredited with scare tactics and condemned as a disgrace to our environment. When the shortages thus produced do finally occur, and massive unemployment and social disorder inevitably follow, then corporations, capitalism and representative democracy itself will be blamed by those very environmentalists who are not capable of any correction. These people, the unaware of their thrust, are attempting to put us back into the stone age where we would wear a breech clout and not disturb the top soil in our efforts to eke out an existance. Any testimony offered by these people, hopefully, will be looked upon with disfavor and we can go ahead with the Northern Tier Pipeline without further delay for many reasons.

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With the increase cost of a limited oil supply from Iran, President Carter's recent oil commitment to Israel, after the year 2000, no further guarantee of the continued use of the Panama Canal and no other pipeline in the offering, it is dangerous to our nation, to further delay the construction and operation of the Northern Tier Pipeline. The following listing summarizes the advantages of the Northern Tier Pipeline.

1 - Would provide economical transportation costs for movement of Alaskan or foreign oil from the West Coast to Northern Tier and upper Midwest refineries.

2 - Port Angeles is the closest U.S. Port to Alaska, the Persian Gulf and Indonesia, the major crude oil producing areas. The proposed marine terminal will be capable of accommodating tankers in the 300,000 dead weight ton class.

3 - U.S. Industry would be stimulated by requirements for steel pipe, tanks, valves, pumps, motors and other equipment.

4 - Incentives for industrial development would be provided in all areas supplied by the pipeline.

5 - Employment, during construction and operations, and tax benefits would be realized totally by the U.S. economy. For instance, Garfield County in Montana would realize in excess of $ 400,000.00 in taxes annually.

6 - Would provide a pipeline completely under U.S. control with embargo-proof characteristics from the West Coast to inland markets, a definite national defense asset.

7 - Would provide a sound, economic long-term solution to the crude oil supply problems of the Northern Tier and upper Midwest states.

8 - The tie-in to the Lakehead system would, in addition to giving access to states and cities as far east as Buffalo, N.Y., provide an avenue for supplying Eastern Canada with crude oil via a U.S. Port.

9 - The Northern Tier Pipeline will replace the supply of crude oil being phased out to our Northern Tier States by Canada and most certainly substitute for the energy lost by the recent closure of the five atomic energy plants due to the dangers of potential earthquakes. If there are any dangers.

The Garfield-McCone Legislative Association, a two County Organization comprised of landowners urges the completion of the Northern Tier Pipeline at the earliest possible time.

Respectfully submitted,

Glen G. Childers, President

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*League of Women Voters of the Spokane Area*

[illegible]

March [illegible], 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sirs:

We would like to compliment you on your present plan for re-routing the Northern Tier pipeline south of the Rathdrum Prairie - Spokane Valley Aquifer.

Our only concern is that the original plan remains your number one alternate and probably the most financially feasible plan. We do not feel that your impact statement addresses strongly enough the negatives of this alternate. The aquifer is one of our greatest natural resources which with protection has an infinite life span. The financial liability of even a small oil spill jeopardizing its natural cycle far out weighs the benefits of a pipeline with a 20 year life expectancy.

We would encourage you to explore other alternative plans and thank you for your consideration.

Sincerely yours,
Natural Resources Chairman

Julie Carlson

Julie Carlson
E. 2906 Timberlane
Veradale, Wa. 99037

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[illegible] FOR PUBLIC HEARING OF MARCH 15, 1979 FOR [illegible]

I find shortcomings in the NT draft impact statement on Air Quality. In my opinion the impact of the NT Pipeline proposal on the environment and the long-term environmental losses have not been discussed in sufficient detail as requested in the State Environmental Policy Act. (Chapter 463-46-440) The serious ecological problems of acid rain and effect of hydrocarbons emissions on human health have been ignored.

ACID RAINS.

Acid rains and snows have well documented undesirable effects on aquatic life in lakes and plant life in forests. (1,2,3) The potential decimation of fishlife in our lakes and streams and the retardation of forest growth will have a serious effect on our industrial economy, tourist business and quality of life on the Olympic Peninsula.

Acid rains result from the oxidation in air of the pollutants, $SO_2$ and $NO_x$. The products are sulfuric and nitric acids. The air is cleansed of these corrosive compounds by rain and snow and fall to the ground as acid rain. Extensive studies of its deleterious effects have been reported. Some of the findings are:

1. Decline in fish population in Norway has been correlated with acidity of streams and lakes, and trout and salmon are seriously affected by pH's less than 5.5. Newly hatched fish are most vulnerable to acid. The pollutants originate in England and Europe.

2. In Sweden about 10,000 lakes have been acidified to pH's less than 6, 5000 of which are below pH 5 and fishless.

3. In the Adirondack Mountains of New York 51% of the mountain lakes have a pH < 5; and 90% of these lakes have no fish. During the period of 1929-37 only 4% of these lakes had a pH of ≤ 5 or were devoid of fish.

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Fishermen no longer find this region the paradise it once was. Tourists avoid the region for this reason.

4. Forest growth has been reduced in southern Scandinavia and in the northeastern U.S. between 1950 and 1970. Norman Glass of EPA estimates that forest production is off 14%. (3) The reason is uncertain but acid rain is a suspected cause. In this connection, however, laboratory and field tests have shown that acid precipitation can affect the germination of conifer seeds and the establishment of seedlings.

The problems of acid rain cannot be ignored. The Northern Tier facility will increase the burden of $SO_2$ for the area by 20%, and of $NO_x$ by 11% at the 933,000 barrels/day level, according to the data of Table 3.12-6.

As far as I know no acid rain measurements have been made on the Olympic Peninsula, nor has any modelling data been obtained. An approximation method for calculating rainfall pH on a multi-state scale has, however, been developed by Pacific Northwest Battelle scientists.(4) The pH of the Olympic National Park's lakes and rivers should be taken and the pH of its rains and snows monitored. Then with the Battelle approximation method it should be possible for Northern Tier to forecast the future acidity of these bodies of water caused by the $SO_2$ and $NO_x$ pollutants. When the pH of these lakes and streams reaches 5.0 they will no longer support fish. For us on the Olympic Peninsula, this acidity hazard is fully as important as the primary pollutants, $SO_2$ and $NO_x$.

HYDROCARBON ISSUE 2.

It is stated on page 3-6 that "hydrocarbons in themselves do not prove to be a health hazard." This statement reveals a careless disregard of the facts. It may apply to the aliphatic or saturated hydrocarbons, but it does not apply to the aromatic hydrocarbons. And since 40% of the whole

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Prudhoe Bay crude oil consists of aromatic hydrocarbons, (5) the impact statement must consider the effects of these compounds on the health of the community.

Benzene, soot, tars and oils are listed among known chemical carcinogens (6). Because benzene, the simplest of the aromatic hydrocarbons, is on the list, it is highly likely that all of its derivatives, as well as all of the condensed ring compounds, present in the Prudhoe Bay crude oil, are potential carcinogens too. While these compounds are much less volatile than

**CONT**

the saturated hydrocarbons used for gasoline, nevertheless they gain access to the atmosphere from spills on the water, on the land, and particularly at the tank farm. Hydrocarbons have been indicted by some as a possible cause of lung cancer. Port Angeles will receive a 36% increase in saturated hydrocarbons, but the cancerous aromatic hydrocarbon content of the air will be increased many-fold.

A recent study found that lung cancer deaths in Texas, especially in the industrialized Houston area, had increased by 53% between 1969 and 1976. (7) The incidence of lung cancer is significantly higher in Texas than in the U.S. as a whole. The area is primarily in the petrochemical industry. While smoking may account for about 50% of the lung cancer cases, the question now is, can rapid population growth and industrial expansion account for the remaining 50%? This University of Texas study does not know.

There are several unknown factors regarding the health hazards of air pollutants. It is stated on page 3-6 that the saturated hydrocarbons are harmless, but what is not known is the toxicity of their oxidized compounds. These products are aldehydes and ketones and they would be expected to be of considerably greater toxicity than the hydrocarbons themselves. Furthermore, those compounds behave more like free radicals, and

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there is one school of thought that regards free radicals in almost any form as potential carcinogens. (8) The remaining hydrocarbons, even without oxidation, are possible carcinogens, especially those in the aromatic and condensed ring systems. The problem here is the same as with that of radiation - what is the threshold? How dangerous are low doses? These matters have recently been discussed. (9) At the present time no one knows whether or not a threshold exists.

A group correlated lung cancer deaths in twenty countries, including the U.S., which have varying degrees of air pollution. (7) From this study the group concluded that lung cancer as indexed by benzopyrene correlated with lung cancer deaths even when cigarette smoking was eliminated as a factor. The group calculated that a microgram of benzopyrene/1000 $m^3$ of air appeared to be associated with a 5% increase in the incidence of lung cancer. They also concluded that a 60% reduction in air pollution might result in a 20% reduction in lung cancer.

An insidious property of the Prudhoe oil is its large fraction of aromatic hydrocarbons (48.5%), all of which are probably cancerous to man. I have already stated that benzene is a carcinogen to man and the benzopyrene mentioned above is carcinogenic at less than one part per trillion parts of air. The residents of Clallam County, particularly those of the Port Angeles and Sequim areas, should be apprised of the potential hazards of these hydrocarbon emissions. A thorough treatment of this aspect of aromatic hydrocarbon pollution must not be omitted from the Northern Tier Environmental Impact Statement.

Edwin J. Hart

Edwin J. Hart
2115 Hart Road
Port Angeles, Wa. 98362

REFERENCES

1. Chemical and Engineering News, p. 25, Nov. 22, 1976.
2. Environmental Science and Technology, 12 510: 1016 (1978).
3. Seattle Times, Mar. 8, 1979.
4. Pacific Northwest Laboratory Annual Report for 1977 (PNL-2500PT3) p. 1.23, Feb. 1978.
5. Proceedings of Symposium on Analytical Chemistry of Petroleum Hydrocarbons in the Marine-Aquatic Environment 23 402 (1976).
6. Science 201 1200, 29 Sept. 1978.
7. Environmental Science and Technology 12 1356 (1978)
8. Science 203 522, 9 Feb. 1979.
9. Science 202 37, 6 Oct. 1978.

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**107**

March 29, 1979

BLM Northern Tier Project
Room 1250 Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Sirs:

I am submitting this as my written testimony regarding the DES on the proposed Northern Tier Pipeline. I shall attempt to be as brief and concise as possible.

First of all, while I appreciate the BLM's attempt to avoid the usual pitfall of turning out an unreadable behemoth for a report, I fear that you have gone too far the other way. The magnitude of the proposed project demands a more thorough coverage. As presented, the DES falls far short of meeting the NEPA requirements. It is simply too full of generalities, lacking in supportive data for many of its assertions, and completely void of crucial material on many subjects.

① Some of the areas, that I believe you must cover far better, are the revegetation plan or procedure, particularly in areas where there is a substantial danger of soil erosion; the impact on the people who's land the pipeline would cross in spite of opposition, i.e. the imposition of eminent domain; and the nature of alaskan crude oil, such as its volitility, water solubility, and its toxicity to all living things! Additionally, your discussion of the alternatives and even the need for and economic viability of this program is insufficient. Then, too, some models of the actual tax impact on individuals and businesses in each county along the right of way should be included. A question that should be explored, but was not, is the effect of default by the company after, before, or during the abandonment phase. You must also include something more specific about what Northern Tier has proposed for the abandonment phase. Perhaps one of the most obvious ommissions is an adequate explanation as to why Northern Tier is asking for a right of way that exceeds the limit set by the 1920 Minerals Leasing Act.

The above testimony regards the DES as a whole. I would now like to focus my remarks on the DES treatment of the area in which I live. However, I would like to state that I believe that the inadequacies of the DES in regard to this particular area are symptomatic of the insufficiency with which it deals with the entire route, with the possible exception of the Port Angeles area.

② I live in the Western portion of Sanders County, Montana. More specifically in the Prospect Creek drainage. My property is encompassed by an area designated as "The Prospect Creek Planning District" by the U.S. Forest Service. They have done the type of research required to meet the NEPA standards for environmental statements, yet the BLM has not availed themselves of this readily available and extremely valuable information for inclusion in the environmental statement on Northern Tier. The publication refered to is USDA - FS - R1 (16) FES - ADM - 76 - 23. The information contained therein is crucial to any statement about the impact of any major project in the area. It brings out such facts as five existing faults that the pipeline would cross as it passed through the creek bottom, which while currently inactive, are very real dangers to any pipeline, partially because we know nothing of their history; the potential for erosion; the nature of the vegetation; the difficulties of revegetation of such an area; the delicacy of the entire ecosystem present there; and areas of slope instability. The BLM's DES, however, makes mention only of the possible eyesore of a pipeline passing through an area with high scenic value. The DES really doesn't even give consideration to the beavers, muskrats, mink, ducks, geese, owls, Blue Herons, eagles, and piliated woodpeckers that live in this area, not to mention people. Furthermore, when I purchased my property last year, there was a prominent statement about the property being in a flood plain written on the contract. Nearly the entire area is so classed and the proposal by Northern Tier as presented in the DES map addendum fails in totality to meet with Montana law concerning the crossing of flood plains; this fact being entirely overlooked in the DES. This matter is utterly crucial and yet isn't even acknowleged in the DES. This geographic area is even omitted from your tables on rivers and streams! This is an extremely sensitive area and yet Northern Tier has proposed no alternate route to it, nor has the BLM. WHY? Is someone getting paid to ignore a potential powderkeg?

The Prospect Creek Planning District is only one of eight such districts in the LOLO NATIONAL FOREST alone through which Northern Tier proposes to pass. Each national forest through which it passes should be able to provide similar information on its planning districts as the publication listed above. Please, do your homework. Include this information in the final statement or it will have to be challenged in court.

My testimony would be far more extensive except for the fact that for the last fifteen days my wife has been in critical condition in a hospital due to an auto accident. She also wished to make testimony about the DES, but is unable to do so at this time as she is in a coma. However, from our previous dicussions of the matter, on her behalf I would like to say, that she feels the DES absolutely fails to meet the intent, spirit, or letter of stipulations of the National Environmental Protection Act regarding environmental statements!!!! Go back to the beginning, and this time do it right.

Sincerely,

James R. Frye

James R. Frye
Box 549
Thompson Falls, Montana
59873

P.S. For a more detailed disection of problems with the DES, please refer to the testimony presented by Mr. Charles Kay of Fairbanks, Alaska.

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Mar 29, 1979

Bureau of Land Management
Lloyd Bldg - 700 N.W. Multanoma
Portland, Ore. 77232.

Dear Sir/madam:

I wish to express deep concern about the proposed Northern Tier Pipeline. As a resident of Whidbey Island and the Puget Sound Area, I would urge further, detailed study of the project to determine the environmental impact to the land and particularly the water areas.

I would sincerely hope that the Bureau will give this matter immediate attention, and delay any approval until definitive and detailed studies are completed.

Yours Very Truly,
Robert G. Abrams (Robert G. Abrams)
P.O. Box 209
Coupeville, WA.
98239.

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March 29 –

Bureau of Land Management
ROOM 1250 Lloyd Bldg.
700 N.W. Multanoma
Portland, OREGON 77232

GENTLEMEN/LADIES:

As a permanent resident of Whidbey Island, I am extremely concerned about the possible impact of the proposed Northern Tier Pipeline on the environment of this island. As a landowner, I also am concerned about the effect of the "permanent easement" agreements necessary to permit construction of the pipeline.

Your immediate investigation in the matter seems important to prevent what could be a serious matter involving the environement of Whidbey Island and Puget Sound.

Thank you for your attention.
Jan M. Chapman (JAN M. CHAPMAN)
7442 750th AVE. WEST OAK HARBOR, WASH 98277

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March 18, 1979
Joe Kipphut
930 Johnson
Missoula, MT 59801

BLM Northern Tier Project
Room 1250 Lloyd Bldg.
700 N.E. Multnomah St.
Portland, OR 97232

To Whom It May Concern:

I am strongly opposed to any pipeline project anywhere. We do not need this pipeline! It would alter our environment drastically along the route. The pipeline would bring in non-natives to rural areas causing many social impacts.

Please include this letter as part of the public hearing record. Please keep me informed of any developments in the Northern Tier Pipeline Project.

Sincerely,
Joe Kipphut

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Seattle Wash
March 31, 1979

Whom Concern:

I did not attend hearings to foot hills Proposal to build a pipe line from Skagway to Keg River Alberta at meetings in Juneau and Skagway. I am a former retired Alaskan commercial fisherman who has fished for years in Lynn Canal area. The tankers coming up canal have no trouble going up canal and hindering fisherman. The winds and storms there are no worst ~~than~~ they have V all day when tankers come and go there if ~~[illegible]~~ bad the tankers just wait until storm dies down. There has been no oil spills there yet. Its just

CONT

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a stupid reasoning about people talking about spills with a strict regulations from US Coast guard. Skagway and all of Alaska would be affect by the oil line it helps stimulate employ more where its needed. Port Angeles is Crowded and booming Cause Congestion so lets build it where there's no congestion and heavy population. most of people in Skagway wanted the oil line to help boost there economy since railroad is in bad shape financially. This would mean more work for people and other people also the tanker route be

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the shortest and oil line the shortest of rest of other Proposals, and also oil from Alberta Canada back on to oil line from Skagway furnish $ more oil for U.S. And part of it going into canada make us better terms with Canada and Canadians help us out on energy situation in U.S.A. I believe its only one better than Northern Tier, California and trans mountain the Cheapest ~~[illegible]~~ easiest and less Complications. So I advocate build it at Skagway Alaska

Elmer Christenson Box 78
507, 3RD AVE Seattle Wash 98104

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Lawyers
HOWARD V. DOHERTY
JOHN H. DOHERTY [illegible]

March 28, 1979

Bureau of Land Management
Northern Tier Impact Statement
700 N.E. Multnomah, Suite 1250
Portland, Oregon 97232

Comments of No Oilport re: Draft Environmental Impact Statement Crude Oil Transportation System.

① It is respectfully submitted that the draft impact statement is inadequate for several reasons. The major reason that the impact statement is inadequate is because it presents inadequate data from which decision makers could draw any adequate conclusion. It is also our feeling that the impact statement is inadequate because of failure to discuss significant legal impediments to various proposed projects and failure to consider alternatives in any detail where there are temporary statutory or regulatory impediments to the project. One last major error in the impact statement is the passive role taken by the writers of the impact statement which hasapparently led them into faulty assumptions and incorrect premises.

## INTRODUCTION

NEPA is in effect an environmental full disclosure law (42 Fed2d, 697). Its purpose is to force decision makers to weigh all the environmental ramifications of a project carefully and to consider the quality of life for future generations, not just for Americans old enough to vote. To this end, the Bureau of Land Management should be exercising its full authority to obtain all relevant information from the applicant.

## INADEQUATE DATA

The impact statement appears to be a "captured" document in that most of the sources of information are the Northern Tier application, or Northern Tier supplied data. Because No Oilport did not submit its written comments before the public hearings, we are in a unique position of demonstrating Northern Tier's lack of "full disclosure". Northern Tier, although it has been discussing the cross sound route as an "alternative", waited until after the end of all public hearings on various impact statements to announce that it was in fact changing the project design and route. Thus, there was no opportunity for public comment on this changed route. This certainly does not comply with the environmental full disclosure tenets of NEPA. The Bureau of Land Management Draft Impact Statement has not apparently requested much of Northern Tier. Although BLM has authority under 43 USC 1761 to require

that the applicants submit and disclose all plans, contracts, agreements or other information reasonably related to the use or intended use of the right of way including its effect on competition as well as the name and address of each shareholder owning 3% or more shares and the name and address of each affiliate of the entity together with ownership information of that affiliate, BLM has not exercised that authority. There should be disclosures. There should be discussions of all related uses such as petrochemical industry, particularly when one of the major stock holders in the Northern Tier Corporation, U.S. Steel, is heavily involved in the petrochemical industry.

BLM, of course, also has clear authority to require extensive mitigating measures (43 USC 1764) including but not limited to bonds and security to insure compliance with all proposed restrictions and regulations. However, BLM has not taken the effort to disclose in the impact statement what conditions it would impose upon the pipeline company. Failure to disclose these conditions does not allow the public to have full and fair comment upon the impact of the project. It is, of course, possible, that the conditions imposed upon the project would make the project either more or less environmentally desirable but the conditions are not disclosed. The impact statement recognized air pollution problems but does not disclose the long term effects of the air pollution. The impact statement does not disclose what the economic impact of added pollutant source in the Port Angeles area would be. For instance, there is not disclosure of whether or not additional industry would be able to locate in the Port Angeles area after the Northern Tier pollutant source is located here.

For the underwater pipeline route, the impact statement does not disclose the pressures needed to pump the oil to the depths to be encountered and up again at the low temperature to be encountered. The impact statement does not disclose what the pressure on the pipeline would be from the water and atmosphere at that particular depth of the pipeline. The impact statement does not discuss how the subterranean underwater pipeline would be inspected over the 20 year anticipated life of the project. The impact statement does not disclose any oil spill risk analysis for the submarine pipeline.

The impact statement also does not disclose what impacts there would be with multiple pipelines or multiple oil ports or a combination of pipelines, oil ports and oil trades and exchange between foreign countries.

Perhaps the most significant deficiency is the failure of the impact statement to even consider whether or not a policy of rushing to use up the finite supply of petroleum is a wise decision. The impact statement simply assumes that such a decision is wise and then simply tries to find the least harmful way to implement that very questionable decision.

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March 28, 1979
Bureau of Land Management
Page Three

LEGAL IMPEDIMENTS

Although the DES points out legal impediments to other competing oil transportation projects, it does not address legal impediments to the Northern Tier project in any detail, if at all. At page 1-60, 61, the DES incorrectly states that Clallam County is presently reviewing its Comprehensive Plan. While this is technically true, Clallam County has already revised its Comprehensive Plan and that plan totally prohibits the Northern Tier or any other pipeline proposal for a terminal, storage facility, refinery, pipeline or other petrochemical industry.

Page 1-61 contains the statement that EFSEC has pre-emptive authority over local land use and zoning controls. This is not correct. This is not a clear reading of RCW 80.50 and it should at least be pointed out that there is a dispute as to whether or not EFSEC does have pre-emptive powers over local land use and zoning controls. In fact, there is litigation in Washington courts on this matter.

At the same page the impact statement fails to point out that Clallam County shoreline master program has an additional legal bar to the project. The DES at 6-3 points out the existence of the Evans Policy Statement and the July 1977 proposed amendment to delete that Policy Statement from the Washington Coastal Zone Program. The DES section fails however to point out the illegality of the Evans Policy Statement as pointed out in the draft impact statement prepared on the proposed WCZMP Amendment No. 1 dated November, 1978, and has pointed out in pleadings seeking to declare the Evans Amendment and/or the entire WCZMP void, found in cause no. C77-578 filed in the United States District Court for the WesternDistrict of Washington. The DES fails to consider the effect of the Marine Mammal Protection Act PL95-136 as amended October 18, 1977, on the Northern Tier proposal. That act clearly prohibits federal approval of various facilities for the transportation of oil if that oil is other than for consumption in the state of Washington. The pumping stations on either end of the submarine pipeline systems are certainly facilities as is thepipeline (as defined in RCW 80.50 and similar federal acts). These facilities are in, on or adjacent to navigable waters of the state of Washington east of Port Angeles. Since the BLM has failed to require Northern Tier to specify the location of the terminal facilities berths, it is not aware that the proposed berths as discussed by Northern Tier in various local discussions are perhaps in and certainly adjacent to navigable waters of the state of Washington, east of Port Angeles. The impact statement fails to consider its own generated data which shows that oil spills from the terminal would be in, on and affecting navigable waters of the state of Washington east of Port Angeles. A litoral reading of the act also makes it abundantly clear that an oil port which is located just west of the eastern boundary of Port Angeles is going to necessarily be adjacent to navigable waters of the state of Washington east Port Angeles. Thus, Northern Tier has the same legal impediments to the construction of its project as do proposals for ports at Cherry Point, Burroughs Bay and projects for expansion of docks such as the dock expansion of Mobile. It is therefore reasonable to assume tht some statotory amendments may occur. If they do, Congress should have the raw data available to evaluate all proposals for the transshipment of oil; not just one.

March 28, 1979
Bureau of Land Management
Page Four

Page 17 of the Washington State Coastal Zone Management Program of 1976 points out that "prevailing state policy at this time indicates that the state (Washington) is not interested in becoming a major petroleum processing center or transportation terminus for a major new pipeline to the midwest. Though how much additional petroleum traffic would actually be generated is not entirely clear". This section of the WCZMP has not been addressed by the BLM DES.

The DES gives an extensive list of acts, rules and regulations which may be legal impediments to the Northern Tier project but does not explain how they may be legal impediments and whether or not any of the alternatives competing proposals would not have them as impediments. It is submitted that it is not reasonable that a proposed oil port which would be the nation's largest oil port have such little information disclosed about it.

At Page 5-11, it is suggested that adverse impacts such as the increase in population of about 300 people could be mitigated 100% by grants or loans received as a result from the construction of the project. It should be pointed out that unless these grants or loans are directly contributed by Northern Tier Pipeline Company, as a requirement of their BLM leases, a federal pass through to state government would violate the state constitutional provisions, against gifts or loans and credit for the benefit of private corporations. Authority to mitigate much of these minor but unavoidable adverse impacts is contained in 43 USC 1764 and 1765, but has not been addressed by the BLM.

43 USC 1765(b)(v) requires location of the right of way along a route that would cause least damage to the environment, taking into consideration feasibility and other relevant factors. The BLM DES does not even attempt to suggest what route should be used but merely acquiesces to the Northern Tier proposals. Considering that BLM is a lead agency, this is ludicrous. Section 1765 requires that the terms and conditions "minimize damage to scenic and aesthetic values and fish and wild life habitat and otherwise protect the environment; require compliance with applicable air and water quality standards established by or pursuant to applicable federal or state law and require compliance with state standards for public health and safety, environmental protection and siting, construction, operation and maintenance of or for rights of way for similar purposes if those standards are more stringent than applicable federal standards. There is no discussion that the BLM is bound by the more stringent state standards relating to the siting of rights of way for oil transshipment. There is no discussion that the proposed Northern Tier project will meet or not meet applicable federal or state air and water quality standards. And of course there is no discussion of any BLM suggested changes in the routing of the right of way.

March 28, 1979
Bureau of Land Management
Page Five

FAULTY ASSUMPTIONS

At page 6-1 the DES totally fails to address a relationship between local short term uses of the environment and the maintenance and enhancement of long term productivity. If this project (Northern Tier) succeeds in providing an increase in oil available for producing refined products, and a consequent increase in the use of those refined products, or even if the project merely succeeds in maintaining the "flow" at current consumption rates, it necessarily follows that the finite quantity of all total oil reserves available to the United States will be more quickly reduced then if there were no pipeline maintaining or increasing supply. In short, if the oil reserves, without the Northern Tier project would last longer than twenty (20) years, then the Northern Tier project's effect on the maintenance and enhancement of long term productivity is a completely negative effect. That is, the project would merely hurry to use up the limited oil reserves available at the expense of future generations. The DES totally fails to address the consequent decrease in long term productivity brought about by a project whose goal is to more rapidly use a limited resource.

CONCLUSIONS

It is submitted that there is a failure of the BLM impact statement to consider whether or not the project is needed versus whether or not it is wanted and what its real long term effects would be as well as a failure to consider any of the alternatives seriously, including those originally proposed by Northern Tier as alternatives and now adopted by Northern Tier as a proposal (cross sound pipeline). These factors make the draft impact statement into little more than a reorganization of Northern Tier produced literature. Failure to consider legal impediments to the Northern Tier project while fully considering legal impediments to all other alternative projects, heightens the obvious bias presented in the impact statement. Failure to seriously consider all alternatives violates the duty imposed upon the BLM as the lead federal agency. Recognition that the site's specific impacts within a two mile wide study corridor could be substantially different depending upon the location of the route within that two mile corridor is an admission that the BLM has totally ignored 43 USC 1765(b)(v).

The serious failure to point out 43 USC 1765(a) and that if Northern Tier is denied certification by the State of Washington or by any other state, that the federal government is in effect prohibited from granting any approval of rights-of-way, and that the state standards, not the federal standards apply to the project and must be required of the applicant by the BLM if the state standards are more stringent than the federal standards,makes the DES totally deficient since it does not delineate the applicable more stringent state standards. In summary, the deficiencies in the impact statement do not allow a great deal of critical comment because of the glaring lack of detailed information even on such things as the actual route selected by Northern Tier.

March 28, 1979
Bureau of Land Management
Page Six

Respectfully submitted,

Craig A. Ritchie
CRAIG A. RITCHIE

CAR/kjt

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**113**

State Of Idaho
**DIVISION OF BUDGET, POLICY PLANNING AND COORDINATION**
EXECUTIVE OFFICE OF THE GOVERNOR
JOHN V. EVANS
Governor
Statehouse
Boise, Idaho 83720

MANAGEMENT SYSTEMS BUREAU
STATE CLEARINGHOUSE
MARCH 29, 1979

BUREAU OF LAND MANAGEMENT
OREGON STATE DIRECTOR
NORTHERN TIER PROJECT
ROOM 1250; LLOYD BLDG
700 N.E. MULTNOMAH
PORTLAND, OREGON 97232

RE: NORTHER TIER PROJECT DEIS
(OUR SAI# 00191708)

SIR:

THE IDAHO STATE CLEARINGHOUSE HAS COMPLETED REVIEW OF THE NORTHERN TIER PIPELINE DRAFT ENVIRONMENTAL IMPACT STATEMENT. THE FOLLOWING STATE AGENCIES AND STATE AREAWIDE CLEARINGHOUSES WERE REQUESTED TO REVIEW AND COMMENT ON THE DRAFT STATEMENT:

AREAWIDE CLEARINGHOUSES:
- CLEARWATER ECONOMIC DEVELOPMENT ASSOCIATION; MOSCOW
- PANHANDLE AREA COUNCIL; COEUR D'ALENE

STATE AGENCIES:
- IDAHO HISTORICAL SOCIETY
- CARY JONES; OFFICE OF THE GOVERNOR
- NATURAL RESOURCES BUREAU; DIVISION OF BUDGET, POLICY PLANNING & COORDINATION
- IDAHO HISTORICAL SOCIETY
- IDAHO DEPT OF FISH & GAME (COMMENTS ATTACHED)
- IDAHO DEPT OF LANDS
- IDAHO DEPT OF PARKS & RECREATION
- IDAHO DEPT OF WATER RESOURCES (COMMENTS ATTACHED)
- IDAHO DEPT OF TRANSPORTATION-HIGHWAYS DIVISION
- IDAHO OFFICE OF ENERGY
- IDAHO PUBLIC UTILITIES COMMISSION
- IDAHO DEPT OF HEALTH & WELFARE-ENVIRONMENT DIVISION (COMMENTS ATTACHED)

THE DEPARTMENTS OF FISH & GAME, WATER RESOURCES AND HEALTH & WELFARE-DIVISION OF ENVIRONMENT SHARE MAJOR CONCERNS NOT FULLY ADDRESSED IN THE DRAFT. THESE INCLUDE: EVALUATION OF THE COEUR D'ALENE SOUTH FORK AS AN ALTERNATIVE ROUTE; ASSESSMENT OF THE IMPACT OF HYDROSTATIC TESTING; CONSIDERATION OF SPILL DETECTION, IMPACT AND CLEAN-UP; AND ASSESSMENT OF ENVIRONMENTAL IMPACT ON CONSTRUCTION AS WELL AS DECOMMISSIONING OF THE PIPELINE. AN ABSTRACT OF COMMON CONCERNS EXPRESSED BY AGENCIES HAS BEEN SUBMITTED BY PAUL CUNNINGHAM, CHIEF OF THE NATURAL RESOURCES BUREAU. ADDITIONAL REMARKS ARE INCLUDED FOR YOUR CONSIDERATION IN THE WRITING OF THE FINAL EIS.

THANK YOU FOR COOPERATING IN THE ENVIRONMENTAL REVIEW PROCESS. PLEASE CONSIDER THE ATTACHED REMARKS IN YOUR FINAL EVALUATIONS.

SINCERELY,

PAM DEMO-RYBUS; CLEARINGHOUSE COORDINATOR

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**A**

①

Comments on the Northern Tier Pipeline Draft EIS

I will present a summary of the major concerns of the State natural resource agencies. First of all, I would like to compliment the BLM and the Northern Tier Pipeline Company on the completeness and high quality of the draft EIS. We find that the proposed route through Idaho to be the most satisfactory of all the alternatives offered. We do, however, have some reservations about the draft EIS.

First, we feel that the draft EIS should have addressed and evaluated the south fork of the Coeur d'Alene route as an alternative.

Secondly, we are concerned about the volume of water that will be required for the hydrostatic testing of the pipeline. We feel that Plummer Creek and Pritchard Creek may not provide adequate volumes of water for the purpose without adversely impacting these streams. We would like to see the south fork of the Coeur d'Alene and St. Joe considered as sources of water for hydrostatic testing. We would like to be assured that the testing screens out fish, because fish would surely be killed if they were put through the pipe.

Thirdly, we would like to be assured that the contingency plan for oil spills and other accidents be reviewed by the State. Along those same lines, we feel that the present spill detection program is inadequate as a spill of a volume of three to four thousand barrels per day could conceivabley occur and not be detected by line sensors. Alternative and more sensitive means of detection of spills need to be addressed.

It is difficult to discuss decommissioning of a pipeline when you don't even have one pipe in the ground, but we feel that the draft EIS should cover all aspects of the pipeline from A to Z and that the eventual decommissioning of the pipeline and the associated impacts were not adequately discussed in the document.

The draft EIS acknowledges several federal programs such as RARE II, the Clean Air Act and the Safe Drinking Water Act, but does not address local 208 Water Quality plans. We feel this is an oversight and should be addressed because of the noted high erosion hazard along some of the proposed pipeline route and because of the number of watersheds crossed.

We feel that there should be some control of the access to the corridor of the pipeline for both safety reasons such as vandalism and sabotage and from an environmental standpoint such as off-road vehicles and hunters.

Finally, the draft EIS did not adequately discuss the necessary commitment of State resources to monitor both the construction and operation of the pipeline for compliance with State laws.

PAUL M CUNNINGHAM; CHIEF
NATURAL RESOURCES BUREAU
DIVISION OF BUDGET, POLICY PLANNING & COORDINATION
STATEHOUSE

3/29/79

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**B**

STATE OF IDAHO
DEPARTMENT OF FISH AND GAME
600 SO. WALNUT ST. P.O. BOX 25
BOISE, IDAHO 83707

March 12, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, OR 97232

Dear Sir:

We have completed our review of the Northern Tier Pipeline draft environmental impact statement. Our review was primarily directed toward that portion of the pipeline that crosses Idaho and the impacts that it would have on fish and wildlife resources. Although we found the statement to be generally adequate in addressing the impacts, we did find some errors in the text along with a failure to adequately describe the full impacts of specific construction and operation phases. Our comments follow.

① Page 2-96, Table 2.1.2.9-1 - In Idaho, wintering bald eagles are also located along the Coeur d'Alene and St. Joe Rivers, as well as Mission Slough.

Page 2-100, Table 2.1.2.9-3 - Cave Lake has less than 10 pair of nesting and breeding Canada geese, not 10,000. Benewah Lake has up to 20,000 wintering waterfowl, not 300.

② Page 3-67, 3.2.6 Aquatic Resources, Construction Phase - The impacts created by hydrostatic testing of the pipeline are not adequately addressed. More specific information is necessary pertaining to location of water withdrawal, time of the year tests would be conducted, screening of intakes, type of bactericide and its effect on aquatic organisms, necessity of NPDES permits to discharge test water into waterways, location of settling ponds, length of time settling ponds will be used, decommissioning of settling ponds and disposition of settled materials. In our opinion the potential impacts of hydrostatic testing can be as significant as oil spills.

③ Page 3-70 - We find the section on oil spill impacts to be inadequate. Methodology of cleaning up spills is not sufficiently addressed, nor are compensation measures for losses to fish and wildlife resources adequately described.

④ Page 3-93 - We consider the spill detection system to be inadequate as far as detecting leaks of up to 4,660 barrels per day. A spill of this magnitude in any major stream or tributary can result in substantial losses. The impacts on small tributary streams from undetected spills can result in long-term losses and be as significant as a major spill. This portion of the statement fails to address this point.

BLM - Northern Tier Project
March 12, 1979
Page 2

The methods of detecting small losses of oil are not described. What is the period of inspections along the pipeline that are designed to detect this type of spill? Alternate methods of detection should be described.

⑤ Alternate Routes - The South Fork of the Coeur d'Alene River was not mentioned as a possible alternate route. For environmental reasons, this route was recommended for consideration by several agencies, environmental groups and individuals at early coordination and consultation meetings. We recommend some comment be made as to why this route was not given consideration.

⑥ Although touched on in several sections of the draft, the decommissioning of the pipeline is not fully nor adequately addressed. The removal of the pipeline is going to create serious impacts on fish and wildlife resources; In many cases, as severe as the construction phase. Creation of an altered environment, by changing forage species in wildlife areas following construction, can serve as an attractant. This creates a situation whereby wildlife species can become dependent and/or enhanced by the habitat change. These losses have not been addressed.

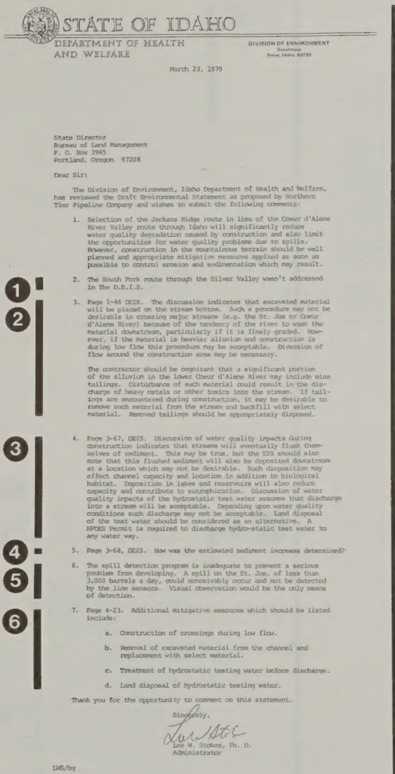
We appreciate the opportunity to comment on this draft and look forward to your inclusion of our recommended changes in the final statement.

Sincerely,

IDAHO DEPARTMENT OF FISH AND GAME

Joseph C. Greenley
Director

C



STATE OF IDAHO
DEPARTMENT OF HEALTH
AND WELFARE
DIVISION OF ENVIRONMENT
Statehouse
Boise, Idaho 83720

March 23, 1979

State Director
Bureau of Land Management
P. O. Box 2965
Portland, Oregon 97208

Dear Sir:

The Division of Environment, Idaho Department of Health and Welfare, has reviewed the Draft Environmental Statement as proposed by Northern Tier Pipeline Company and wishes to submit the following comments:

1. Selection of the Jackass Ridge route in lieu of the Coeur d'Alene River Valley route through Idaho will significantly reduce water quality degradation caused by construction and also limit the opportunities for water quality problems due to spills. However, construction in the mountainous terrain should be well planned and appropriate mitigative measures applied as soon as possible to control erosion and sedimentation which may result.

① 2. The South Fork route through the Silver Valley wasn't addressed in The D.E.I.S.

② 3. Page 1-46 DEIS. The discussion indicates that excavated material will be placed on the stream bottom. Such a procedure may not be desirable in crossing major streams (e.g. the St. Joe or Coeur d'Alene River) because of the tendency of the river to wash the material downstream, particularly if it is finely graded. However, if the material is heavier alluvium and construction is during low flow this procedure may be acceptable. Diversion of flow around the construction area may be necessary.

The contractor should be cognizant that a significant portion of the alluvium in the lower Coeur d'Alene River may include mine tailings. Disturbance of such material could result in the discharge of heavy metals or other toxics into the stream. If tailings are encountered during construction, it may be desirable to remove such material from the stream and backfill with select material. Removed tailings should be appropriately disposed.

③ 4. Page 3-67, DEIS. Discussion of water quality impacts during construction indicates that streams will eventually flush themselves of sediment. This may be true, but the EIS should also note that this flushed sediment will also be deposited downstream at a location which may not be desirable. Such disposition may effect channel capacity and location in addition to biological habitat. Deposition in lakes and reservoirs will also reduce capacity and contribute to eutrophication. Discussion of water quality impacts of the hydrostatic test water assumes that discharge into a stream will be acceptable. Depending upon water quality conditions such discharge may not be acceptable. Land disposal of the test water should be considered as an alternative. A NPDES Permit is required to discharge hydro-static test water to any water way.

④ 5. Page 3-68, DEIS. How was the estimated sediment increase determined?

⑤ 6. The spill detection program is inadequate to prevent a serious problem from developing. A spill on the St. Joe, of less than 3,000 barrels a day, could conceivably occur and not be detected by the line sensors. Visual observation would be the only means of detection.

⑥ 7. Page 4-23. Additional mitigative measures which should be listed include:

   a. Construction of crossings during low flow.
   b. Removal of excavated material from the channel and replacement with select material.
   c. Treatment of hydrostatic testing water before discharge.
   d. Land disposal of hydrostatic testing water.

Thank you for the opportunity to comment on this statement.

Sincerely,

Lee W. Stokes, Ph. D.
Administrator

LWS/bg

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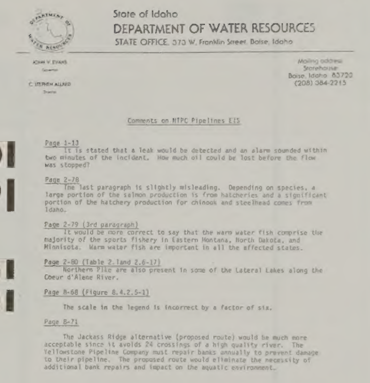
D



State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 373 W. Franklin Street, Boise, Idaho
JOHN V. EVANS
Governor
C. STEPHEN ALLRED
Director
Mailing address:
Statehouse
Boise, Idaho 83720
(208) 384-2215

Comments on NTPC Pipelines EIS

① Page 1-13
It is stated that a leak would be detected and an alarm sounded within two minutes of the incident. How much oil could be lost before the flow was stopped?

② Page 2-78
The last paragraph is slightly misleading. Depending on species, a large portion of the salmon production is from hatcheries and a significant portion of the hatchery production for chinook and steelhead comes from Idaho.

Page 2-79 (3rd paragraph)
It would be more correct to say that the warm water fish comprise the majority of the sports fishery in Eastern Montana, North Dakota, and Minnisota. Warm water fish are important in all the affected states.

③ Page 2-80 (Table 2.1and 2.6-17)
Northern Pike are also present in some of the Lateral Lakes along the Coeur d'Alene River.

④ Page 8-68 (Figure 8.4.2.5-1)

The scale in the legend is incorrect by a factor of six.

Page 8-71

The Jackass Ridge alternative (proposed route) would be much more acceptable since it avoids 24 crossings of a high quality river. The Yellowstone Pipeline Company must repair banks annually to prevent damage to their pipeline. The proposed route would eliminate the necessity of additional bank repairs and impact on the aquatic environment.

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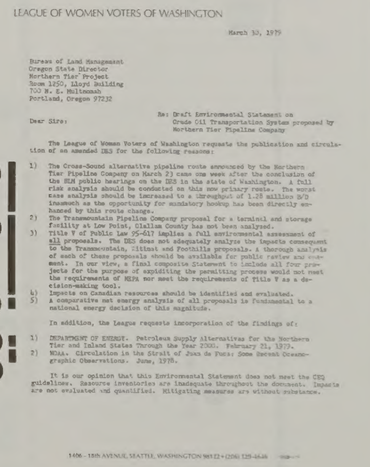

LEAGUE OF WOMEN VOTERS OF WASHINGTON

March 30, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Re: Draft Environmental Statement on
Crude Oil Transportation System proposed by
Northern Tier Pipeline Company

Dear Sirs:

The League of Women Voters of Washington requests the publication and circulation of an amended DES for the following reasons:

① 1) The Cross-Sound alternative pipeline route announced by the Northern Tier Pipeline Company on March 23 came one week after the conclusion of the BLM public hearings on the DES in the state of Washington. A full risk analysis should be conducted on this now primary route. The worst case analysis should be increased to a throughput of 1.28 million B/D inasmuch as the opportunity for mandatory hookup has been directly enhanced by this route change.

② 2) The Transmountain Pipeline Company proposal for a terminal and storage facility at Low Point, Clallam County has not been analyzed.

3) Title V of Public Law 95-617 implies a full environmental assessment of all proposals. The DES does not adequately analyze the impacts consequent to the Transmountain, Kitimat and Foothills proposals. A thorough analysis of each of these proposals should be available for public review and comment. In our view, a final composite Statement to include all four projects for the purpose of expiditing the permitting process would not meet the requirements of NEPA nor meet the requirements of Title V as a decision-making tool.

4) Impacts on Canadian resources should be identified and evaluated.

③ 5) A comparative net energy analysis of all proposals is fundamental to a national energy decision of this magnitude.

In addition, the League requests incorporation of the findings of:

④ 1) DEPARTMENT OF ENERGY. Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000. February 21, 1979.

⑤ 2) NOAA. Circulation in the Strait of Juan de Fuca: Some Recent Oceanographic Observations. June, 1978.

It is our opinion that this Environmental Statement does not meet the CEQ guidelines. Resource inventories are inadequate throughout the document. Impacts are not evaluated and quantified. Mitigating measures are without substance.

1406 - 18th AVENUE, SEATTLE, WASHINGTON 98122 • (206) 329-4646

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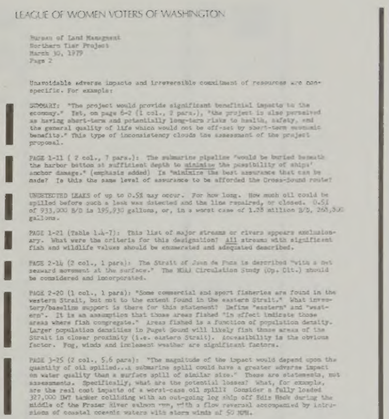
CONT.



LEAGUE OF WOMEN VOTERS OF WASHINGTON

Bureau of Land Management
Northern Tier Project
March 30, 1979
Page 2

Unavoidable adverse impacts and irreversible commitment of resources are non-specific. For example:

⑥ SUMMARY: "The project would provide significant beneficial impacts to the economy." Yet, on page 6-2 (1 col., 2 para.), "the project is also perceived as having short-term and potentially long-term risks to health, safety, and the general quality of life which would not be off-set by short-term economic benefits." This type of inconsistency clouds the assessment of the project proposal.

⑦ PAGE 1-11 ( 2 col., 7 para.): The submarine pipeline "would be buried beneath the harbor bottom at sufficient depth to minimize the possibility of ships' anchor damage." (emphasis added) Is "minimize the best assurance that can be made? Is this the same level of assurance to be afforded the Cross-Sound route?

⑧ UNDETECTED LEAKS of up to 0.5% may occur. For how long. How much oil could be spilled before such a leak was detected and the line repaired, or closed. 0.5% of 933,000 B/D is 195,930 gallons, or, in a worst case of 1.28 million B/D, 268,800 gallons.

⑨ PAGE 1-21 (Table 1.4-7): This list of major streams or rivers appears exclusionary. What were the criteria for this designation? All streams with significant fish and wildlife values should be enumerated and adequated described.

⑩ PAGE 2-14 (2 col., 1 para): The Strait of Juan de Fuca is described "with a net seaward movement at the surface." The NOAA Circulation Study (Op. Cit.) should be considered and incorporated.

⑪ PAGE 2-20 (1 col., 1 para): "Some commercial and sport fisheries are found in the western Strait, but not to the extent found in the eastern Strait." What inventory/baseline support is there for this statement? Define "eastern" and "western". It is an assumption that those areas fished "in effect indicate those areas where fish congregate." Areas fished is a function of population density. Larger population densities in Puget Sound will likely fish those areas of the Strait in closer proximity (i.e. eastern Strait). Accessibility is the obvious factor. Fog, winds and inclement weather are significant factors.

⑫ PAGE 3-25 (2 col., 5,6 para): "The magnitude of the impact would depend upon the quantity of oil spilled...a submarine spill could have a greater adverse impact on water quality than a surface spill of similar size." These are statements, not assessments. Specifically, what are the potential losses? What, for example, are the real cost impacts of a worst-case oil spill? Consider a fully loaded 327,000 DWT tanker colliding with an out-going log ship off Ediz Hook during the middle of the Fraser River salmon run, with a flow reversal accompanied by intrusions of coastal oceanic waters with storm winds of 50 MPH.

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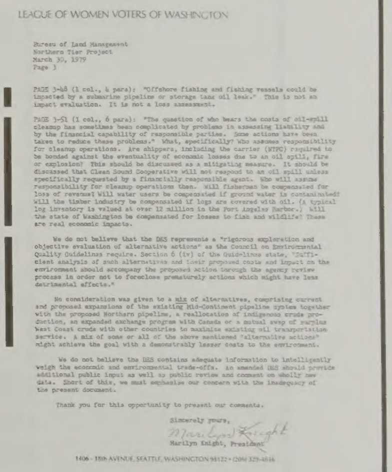

LEAGUE OF WOMEN VOTERS OF WASHINGTON

Bureau of Land Management
Northern Tier Project
March 30, 1979
Page 3

⑬ PAGE 3-48 (1 col., 4 para): "Offshore fishing and fishing vessels could be impacted by a submarine pipeline or storage tank oil leak." This is not an impact evaluation. It is not a loss assessment.

⑭ PAGE 3-51 (1 col., 6 para): "The question of who bears the costs of oil-spill cleanup has sometimes been complicated by problems in assessing liability and by the financial capability of responsible parties. Some actions have been taken to reduce these problems." What, specifically? Who assumes responsibility for cleanup operations. Are shippers, including the carrier (NTPC) required to be bonded against the eventuality of economic losses due to an oil spill, fire or explosion? This should be discussed as a mitigating measure. It should be discussed that Clean Sound Cooperative will not respond to an oil spill unless specifically requested by a financially responsible agent. Who will assume responsibility for cleanup operations then. Will fishermen be compensated for loss of revenue? Will water users be compensated if ground water is contaminated? Will the timber industry be compensated if logs are covered with oil. (A typical log inventory is valued at over 12 million in the Port Angeles Harbor.) Will the state of Washington be compensated for losses to fish and wildlife? These are real economic impacts.

⑮ We do not believe that the DES represents a "rigorous exploration and objective evaluation of alternative actions" as the Council on Environmental Quality Guidelines require. Section 6 (iv) of the Guidelines state, "Sufficient analysis of such alternatives and their proposed costs and impact on the environment should accompany the proposed action through the agency review process in order not to foreclose prematurely actions which might have less detrimental effects."

No consideration was given to a mix of alternatives, comprising current and proposed expansions of the existing Mid-Continent pipeline system together with the proposed Northern pipeline, a reallocation of indigenous crude production, an expanded exchange program with Canada or a mutual swap of surplus West Coast crude with other countries to maximize existing oil transportation service. A mix of some or all of the above mentioned "alternative actions" might achieve the goal with a demonstrably lesser costs to the environment.

We do not believe the DES contains adequate information to intelligently weigh the economic and environmental trade-offs. An amended DES should provide additional public input as well as public review and comment on wholly new data. Short of this, we must emphasize our concern with the inadequacy of the present document.

Thank you for this opportunity to present our comments.

Sincerely yours,

Marilyn Knight
Marilyn Knight, President

1406 - 18th AVENUE, SEATTLE, WASHINGTON 98122 • (206) 329-4646

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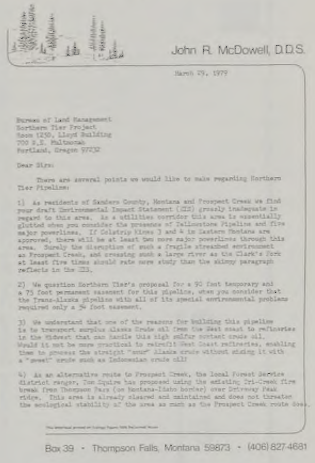

John R. McDowell, D.D.S.

March 29, 1979

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sirs:

There are several points we would like to make regarding Northern Tier Pipeline:

① 1) As residents of Sanders County, Montana and Prospect Creek we find your draft Environmental Impact Statement (EIS) grossly inadequate in regard to this area. As a utilities corridor this area is essentially glutted when you consider the presence of Yellowstone Pipeline and five major powerlines. If Colstrip Kines 3 and 4 in Eastern Montana are approved, there will be at least two more major powerlines through this area. Surely the disruption of such a fragile streambed environment as Prospect Creek, and crossing such a large river as the Clark's Fork at least five times should rate more study than the skimpy paragraph reflects in the EIS.

② 2) We question Northern Tier's proposal for a 90 foot temporary and a 75 foot permanent easement for this pipeline, when you consider that the Trans-Alaska pipeline with all of its special environmental problems required only a 54 foot easement.

③ 3) We understand that one of the reasons for building this pipeline is to transport surplus Alaska Crude oil from the West coast to refineries in the Midwest that can handle this high sulfur content crude oil. Would it not be more practical to retrofit West Coast refineries, enabling them to process the straight "sour" Alaska crude without mixing it with a "sweet" crude such as Indonesian crude oil?

④ 4) As an alternative route to Prospect Creek, the local Forest Service district ranger, Tom Squire has proposed using the existing Tri-Creek fire break from Thompson Pass (on Montana-Idaho border) over Driveway Peak ridge. This area is already cleared and maintained and does not threaten the ecological stability of the area as much as the Prospect Creek route does.

Box 39 • Thompson Falls, Montana 59873 • (406) 827-4681

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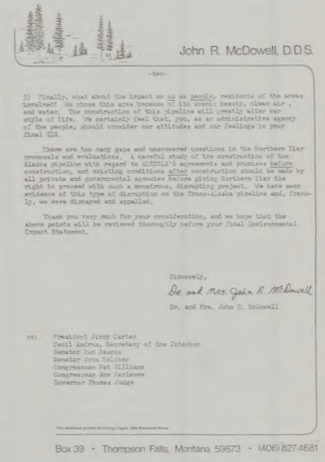

John R. McDowell, D.D.S.

-two-

⑤ 5) Finally, what about the impact on us as people, residents of the areas involved? We chose this area because of its scenic beauty, clean air, and water. The construction of this pipeline will greatly alter our style of life. We certainly feel that, you, as an administrative agency of the people, should consider our attitudes and our feelings in your final EIS.

There are too many gaps and unanswered questions in the Northern Tier proposals and evaluations. A careful study of the construction of the Alaska pipeline with regard to ALYESKA'S agreements and promises before construction, and existing conditions after construction should be made by all private and governmental agencies before giving Northern Tier the right to proceed with such a monstrous, disrupting project. We have seen evidence of this type of disruption on the Trans-Alaska pipeline and, frankly, we were dismayed and appalled.

Thank you very much for your consideration, and we hope that the above points will be reviewed thoroughly before your final Environmental Impact Statement.

Sincerely,

Dr. and Mrs. John R. McDowell
Dr. and Mrs. John R. McDowell

cc: President Jimmy Carter
Cecil Andrus, Secretary of the Interior
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee
Governor Thomas Judge

Box 39 • Thompson Falls, Montana 59873 • (406) 827-4681

**116**

[illegible]

[illegible] review covers that portion of the Northern Tier Pipeline. The alternate route [illegible] between mile posts 46 and 50. General area known as [illegible] Creek to [illegible] Creek and within Township [illegible] and Range [illegible], [illegible].

General Notes: The EIS is inadequate for the alternate route and does not meet the NEPA law requirements because of major omissions. The information is incomplete and not adequate to make a decision on a general route let alone a final decision.

Many items are left out or only inferred to. The EIS is difficult to read and to pick out detail. One has the impression of reviewing a Corps of Engineer or EPA proposal where the need and details of a re-regulating dam or need for a second powerline for reliability are easily dismissed. Consequently we are not certain what is planned.

There is in effect a real lack of trust because of what is left unsaid. Because of the limited data it is difficult for us to review and comment on impacts since impacts are not displayed. Following are specific comments.

① 1. PUMP STATIONS. No locations are shown. We were unable to determine the size of the installations. No details on service facilities i.e. roads, powerlines, telephone and other associated developments. It appears that larger quantities of electricity will be needed which includes a major powerline. Visual controls are not mentioned or available in the EIS for specific locations.

② 2. [illegible]. [illegible] the original route was based on [illegible]. The proposed alternative is routed through several subdivisions. Most of the houses have been built in the last five years. Actually the aerial photo strips may be several years old and does not reflect the current situation.

There is no discussion on why the route went through subdivisions when other alternatives were available. No indication of the selection process and short versus long term impacts. The statistics on population and developments are not up-to-date. The costs of obtaining R/W, replacing fences, crossing roads and disturbing access are not considered.

Of concern to land owners is the deterioration of land value and particularly the loss of selection of siting for buildings because of R/W restrictions. Many owners are in the process of or are considering splitting tracts into five acre lots. The pipeline reduces their options and can result in a financial loss. These opinions are based on information from realtors and land appraisers who live in the area.

③ 3. SOILS. The proposed route mostly lies in clay, clay-silt or clay containing soils i.e. [illegible], Lake Missoula Sediments, etc. There are particular problems associated with construction, stability, rehabilitation, maintenance, etc. that make these soils less desirable. Particularly when gravelly soils are nearby. Construction in Lake Missoula sediments can also interrupt aquifers and change the flow characteristics which could result in slumping or disturbance of existing water developments.

④ [illegible] the route until [illegible] Northern Tier. While these are two separate actions there nevertheless is a potential relationship that can cause hardship. The continuing harassment of people in this area, and the threat to social well being is real. It would appear that the EIS's prepared by the Interior Department would have some correlation particularly since they are being presented at the same time and are using the same [illegible].

**CONT**

⑤ 5. [illegible]. [illegible] proposed is within the [illegible] Lineament, a regional tectonic feature [illegible] called the Lewis and Clark fault zone or [illegible]. The EIS does not indicate anything in this area yet shocks of [illegible] on the Richter scale occurred in the [illegible] vicinity in 1975 along with numerous aftershocks.

The gravelly alluvium is better for siting the pipeline. The gravels generally would be less affected by seismic activity than the finer silts and clays on the benches.

[illegible]. Local employment is needed and [illegible] that will reduce the social and economic impacts are available.

⑥ [illegible]. There are no assurances in the EIS that land-owners rights will be protected in the event of construction problems or in the event that the pipeline leaks. Experience indicates that [illegible] to correct damages. The [illegible]

⑦ [illegible]. This is an [illegible] and the amount [illegible] be substantial — estimated at over 300,000 gallons. The proposed location would not only harm the immediate area but it is above a major irrigation system (Frenchtown Ditch) that would pollute thousands of acres.

These are some of our concerns. Since the EIS had inadequate coverage we would like the opportunity to comment in detail. Please address your correspondence to the Association President, Mr. Randall [illegible], Box 156, Frenchtown, Montana 59834.

cc Governor of Montana
Senator Baucus
Senator Melcher
Representative Williams
BLM
Northern Tier Pipeline - c/o Mr. T. C. Bryner
Secretary of Interior

Mr & Mrs Randall [illegible]
[illegible]
Jay Howard
[illegible]
Mr & Mrs E. Nakoleyczik
Ron + Tanja Sarnoh
Mr & Mrs Joel B. Duffy
[illegible]
Mr & Mrs Dick Bass

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**117**

3265 North Rose Lane
Oak Harbor, Washington 98277
March 28, 1979

Bureau of Land Management
Room 1250, Lloyd Building
700 NE Multnomah
Portland, Oregon 97232

Dear Sir;

I understand that your organization has been made the "lead Agency" for the proposed Northern Tier Pipeline. I have wanted to contact someone ever since I read the recent newspaper article indicating a decision had been reached to utilize the alternate route across Whidbey Island, Camano Island into Stanwood. How could a firm decision be reached without any public hearings in the areas directly involved? It seems to have been a capricious and inconsiderate determination, and I , for one, am most disturbed!

Northern Tier had announced that they would have representives meet with the concerned citizens of Island County on February 27th. When the meeting convened, the "representives" proved to be a consultant firm, hired to determine what kind of questions we would like to have answered, but they were not able (or permitted) to provide any answers. To me such a meeting was a waste of time, both ours and theirs. When pressed about an Environmential Impact Statement, the response indicated that one had been prepared, but that the Whidbey-Camano Crossing had been treated only as an alternate (and as incidental). Can such an EIS be considered as reasonable and sufficent in the light of the decision to use the alternate? We had asked for an opportunity to review the prepared statement and were advised that copies would be provided, but as of this date we have not heard a word, and one gets the impression that we are not likly too.

It is absolutely essential that our questions be answered. Northern Tier can hardly expect us to show any consideration if they refuse to show us even the slightest courtesy! We want to know what precautions will be exercised during and after construction; who will provide the perpetual maintenance of the right of way etc., etc. Why, indeed, must the line be built when no government seems willing to file a "Certificate of Need"?

One gets the feeling that Northern Tier has absolutely no respect or concern for the people of Island County, and are ready to ride rough shod over anyone. The fiasco of the February 27th meeting and the casual, even shabby treatment demonstrated towards us is miserable public relations and cannot be tolerated.

As the lead agency what would be your suggested action for the local citizens to take in order to obtain satisfaction? We appreciate your concern.

Very truly yours,

Walter I. Lewis

Walter I. Lewis

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**118**

Plaza, North Dakota
March 26, 1979

Oregon State Office
Northern Tier Project
729 N.E. Oregon St.
Portland, Oregon 97208

Gentlemen:

As a result of the Northern Tier Project Hearing in Minot, North Dakota, we would like to add this information to the minutes of that meeting.

First, we realize there is need for the pipeline.

Secondly, we have several concerns:

① 1) That the construction of this line does not destroy farm trees and shelterbelts. In the dry land farming area of North Dakota, trees are often difficult to raise and slow to mature. After telling us they would transplant the evergreens standing within their right-of-way, Portal Pipeline crews bulldozed all the evergreen trees within their path, and by movement of their equipment beyond the right-of-way, they killed more trees unnecessarily.

② 2) From a statement made at the Minot Hearing, it is proposed to cover the line by three feet of soil. In fact this should be increased to at least five feet of soil. The alkaline seep is ruining some of my land for production purposes. To restore this land to production it is necessary to plow the soil to a depth of four feet. By turning under the defective top soil deeply, fresh soil is brought to the surface for agricultural use. You can see that the pipeline would need to be at least one foot below the land being worked for alkali.

3) Again, by statements made at the Minot Hearing, in this area Northern Tier will follow rather closely the line used by the present Portal Pipeline. The Portal line cuts our farm for a mile east and west, and runs within approximately 100 feet of the door of my home. It is closer to some of my other buildings.

We realize the importance of this proposed pipeline. But with a gas line cutting the south part of our land and Portal just beyond our trees, the Northern Tier would be the third line cutting our property where we are trying to produce food to feed the nation and the world.

We will appreciate your consideration in the placing of this line.

Respectfully,
Lloyd R. Jones and
Caroline Jones

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**119**

① Bureau of Land Management
Oregon State Director
Northern Tier Project

Room 1250, Lloyd Bldg.
700 N.E. Multnomah
Portland, Ore. 97232

March 29, 1979

Re: Air Pollution Impact of Proposed Northern Tier Pipeline

Attn: Ron Sundell

Dear Sir

This letter is to protest the inadequacy of the air pollution monitoring studies being conducted by Northern Tier Pipeline Co. and to protest the timing of initiation of these studies. Northern Tier Pipeline co., using the data collected by a supposedly independent engineering firm, is gathering air pollution data to be presented as evidence of the air quality in the Port Angeles area. This letter is in portest on the inadequacy of the sites of monitoring and the timing at which this data collection began.

One of the important areas of our city that has been overlooked in air pollution discussions is the Olympic Memorial Hospital. This is the only major hospital on the North Olympic Peninsula and sits facing the open bluff directly across the water from the proposed oil port terminal. The distance between the oil port terminal and the hospital is between on and one and a half miles. The hospital also is located between the two major pulp and paper mills in the city and is already subject ot a large amount of air pollution from these two industrial sites. This summer there was one day when the entire north side of the hospital rooms had to be shut down and the patients moved out because of high air pollution from these mills. Air pollution is a chonically recurrent problem in our hospital. No monitoring devices of air pollution have ever been taken from the hospital grounds. I am suggesting that air quality monitoring equipment be located on the hosptial grounds, preferrably the roof of the hospital, to gather valuable data concerning the air pollution levels while the mills are operating.

The air quality monitoring stations which have been erected and are being monitored by the consulting firm which is working for Northern Tier began collecting air pollution data in this area one week after the local pulp and paper mills shut down on strike. The pulp and paper mills of this area are the major contributors to air pollution and the air pollution locally is severe during the months of August through October. In July of 1978, both Crown Zellerbach and the ITT Rayonier mills shut down and remained on strike during the entire fall and winter months. According to the management of these mills during August, September and October the mills were being operated by management at approximately 20 to 30% usual capacity. During the second three monhths of the strike in November, December and January the mill capacity was then increased to close to its usual output. The worst three months for air pollution in Port Angeles is August, September and October. Routinely there is little air pollution in November, December and January because of brisk westerly winds.

I feel the coincidence of the initiation of data gathering corresponding to the closing of the mills in the area makes data gathering thus far totally irrelevent. I would porpose air pollution data be gathered while the mills are in full operation with particular attention being paid to the monhts of August through October since this is our heaviest pollution time. I would also suggest that a monitoring station be erected on the grounds of Olympic Memorial Hospital.

I would appreciate an explanation as to why the importance of air pollution in the vicinity of the hospital has been totally ignored.

Sincerely yours

John R. Mather

**120**

Star Route
Huson, Montana 59846

March 26, 1979

BLM-Northern Tier Project
Room 1050, Lloyd Building
700 N. E. Multnomah Street
Portland, Oregon 97232

Gentlemen:

Enclosed you will find our comments and questions relating to the draft Environmental Impact Statement issued by your agency for the proposed Northern Tier Pipeline project.

As detailed in the section GENERAL CONSIDERATIONS, we feel the proposal fails to address the following questions:

-The fact that two thirds of the proposed route falls on private land and yet the opinions of landowners have not been assessed.

-Establishment of an energy corridor without critical assessment of the cumulative effects of such multiple use.

-Appropriate and accurate studies of the water resources of the areas involved in corridor establishment for the pipeline.

-The need for independent quality control before, during and after construction.

-Identification and detailed assessment of all viable alternatives to the project proposed.

-The very obvious lack of time which is critical for proper pre-impact, construction impact, and post-construction impact studies.

We wish to express grave concern with the fact that this draft Environmental Impact Statement is both outdated and inappropriate to the pipeline route as presently proposed by Northern Tier.

Thank you for the opportunity to express our concerns.

VALLEYS PRESERVATION COUNCIL

Jan Rippe, Chairman

Rene Grauer, ViceChairman

JR/RG:eb
Enclosure as above.

COMMENTS ON DRAFT ENVIRONMENTAL STATEMENT
CRUDE OIL TRANSPORTATION SYSTEM
AS PROPOSED BY THE NORTHERN TIER PIPELINE COMPANY

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① p.1-5 Projected demand should be estimated from more than one source. Demography and economics should be included.

p.1-8 Canadian supplies do exist after 1980. Document the decrease in production of the Northwest. Again, estimated shortfalls are based on what?

② p.1-16 Section on Pipeline System. The pipeline route has been altered so many times that the entire DES needs revision.

p.1-18, 1-23 Site specific river crossing techniques should be outlined.

p.1-24 Pipeline. Nature and location of scraper traps should be specified. Mainline valve locations are not accurate because of route changes in western Montana.

p.1-35 As stated in the DES, field inspection and quality control will be monitored by NTPC. This is totally unacceptable, obviously, due to vestment of interest. Independent inspectors are absolutely necessary.

p.1-38 Specific storage yards and facilities are not mentioned. In particular, what would be the impact of these storage areas? Where would the Ninemile stockpile be?

p.1-41 Who estimates construction damages? How are these damages compensated? Damages to public lands are not addressed.

Clear definition of "access to the pipeline" must be given.

②a Justification for a 75-foot easement must be made.

p.1-43 An actual photograph of a construction spread and not an artist's conception is necessary.

p.1-44 How are forests logged? Slash removed? How is soil which has been "stabilized to support heavy equipment" restored? How are access roads constructed for equipment moving restored? Alteration of existing roads is not addressed.

p.1-44 Who would insure integrity and closure of gates for livestock control? Who will monitor double-ditching? Will there be air pollution from external coating process? What type of coating will be used?

If the ground is "compacted to its original state" then where does the "crown" of excess material go?

p.1-46 Would there be settling ponds for dredging operations? Would there be spoil piles and streambank alterations?

"Riprap and other materials..." is in direct contradiction to statement #22, p.1-58.

"Major stream crossings would be scheduled in a three month period..." is in contradiction with the proposed construction schedule.

What is a "major stream"?

What is the authority and qualifications of the "environmental inspector representing NTP"?

②b p.1-47 The whole hydrostatic testing section is completely inadequate. For example:
1) How much water is required?
2) The additives to the water are not specified.
3) Discharge water erosion prevention is not mentioned.

CONT.

②b
4) Surface water contamination is inescapable. If much of the available water is used, the whole supply will be contaminated.
5) How will test water be routed from its origin to the pipeline? Does this come under "access" (see p.1-41)?
6) The removal of test water from creeks and rivers will be in direct violation of Montana and federal water rights laws. This conflict is inescapable and must be resolved.

② "The purpose of the cleanup and restoration operation would be to return the right of way and other areas affected by construction to their original conditions where practical..." Define "where practical". Departure from practicality must be site specific.

The contour of the soil is returned but what about the soil itself?

What is a "pipeline marker suitable for observation from the air"?

How about revegetation plans for private landowners?

p.1-50 Abandonment and Disposal. Where would flush water go? If local water is used, how about water rights?

p.1-55 "Minor spills generally cause minimal impacts" is really meaningless unless actual gallons are specified. What is the difference between a spill and a leak? Possibility of leak detection by EROS or ERTS satellite should be mentioned.

p.1-56 Measures Proposed for Environmental Protection.

#4 One inspector per spread is not sufficient. Inspectors should be independent of NTPC and should have stop work authority.

#6 "Any unsuitable and surplus material...will be disposed of on the site whenever possible" really means that any excess material will be dumped whenever and wherever it is convenient for the contractor.

#9 The Ninemile Valley is an unrecoverable resource as is Siegel Pass, and the route should be adjusted.

#11 Dust producing areas should also be watered in rural areas such as the Ninemile Valley.

#13 Any settling pond sites required should be specified fully in the final EIS.

#15 The Ninemile Valley is a critical watershed and should be studied in greater detail.

#17 Who would decide what is "reasonable project economics" when routing river and stream crossings?

p.1-57 #21 Stream hydrolics and geotechnical studies should be done in the EIS and should be site specific.

#22 There is no way that the natural water flow will be unaffected by the pipeline.

#23 In view of the magnitude of this pipeline, should the engineering specs and requirements be examined to see if they are really adequate?

#25 The fact that Northern Tier would assist only in applying for federal and/or state aid to mitigate any adverse impacts is a gross insult to the taxpayer and individual landowner! Northern Tier should be liable for all damages whether direct or indirect, not the taxpayer.

#26 Northern Tier's plans to utilize local labor and to arrange for temporary housing is just worthless public relations rhetoric. Construction realities would bear this out. What provisions would be made for recreational vehicles and campers--especially on the National Forest camp areas?

#27 The ballasting will be determined by safety not by the vicinity of the tanker to the harbor.

③ p.2-47 "Mean annual precipitation ranges between 20 and 40" in mountainous areas of northern Idaho and western Montana depending on elevation." Mean annual precipitation for Ninemile-Sixmile areas to be crossed by the pipeline is less than 20" (Multiple Use Plan, Ninemile-Mill Planning Unit, U.S.F.S., 1976). This must be kept in mind particularly as regards revegetation. Likewise, the mean monthly temperatures quoted are not applicable to this area and are in need of correction to reflect the severeextremes to be faced by seedlings.

④ p.2-48 "Windblown dust sometimes causes high particulate readings in rural areas." The Missoula County Board of Health can verify the severity of this condition in the Ninemile-Sixmile area. And yet, p.4-2 under 4.2 Air Quality, "No significant mitigating measures identified." ?????

⑤ p.2-50 "Gentle to steep slopes make them (i.e. soils of northern Rocky Mts. physiographic region) moderately to highly susceptible to water erosion." How will this be prevented? The pipeline will cross 15 streams in this valley with the danger of disrupted water flow. Will original stream gradients be maintained at stream crossings after construction thereby preventing severe erosional areas from starting and/or accentuating?

⑥ p.2-95 The on-site surveys for threatened and endangered species should be done before the final EIS and certainly before issuance of permits. Remember the snail darter! Specific attention needs to be given the bald eagle and peregrine falcon.

⑦ p.2-98 The Ninemile area is every bit as important as the Clark Fork River valley and for the same reasons. It is rich in diverse wildlife resources. Specifically, the Ninemile-Sixmile valleys are prime elk and deer wintering areas.

⑧ p.2-103 There are many logging and mining camps, as well as Indian summer campsites, throughout the Ninemile-Sixmile area.

The archaeological surveys should be conducted before pipeline permits are let! Table 2.1.2.10-1 should be amended to include the areas currently proposed by NTPC.

⑨ p.2-116 The Ninemile Valley is again neglected. Visual impact due to erosion and scars would be very high.

⑩ p.2-120 Table 2-1.2.12-6 must be updated. Many acres of farmland will be crossed.

⑪ p.2-122 Table 2.1.2.12-7 should include Frenchtown, a rural center.

⑫ p.2-124 Are there any pristine or relic vegetative communities along the altered route? If so, they should be considered.

CONT.

⑬ p.2-139 Ninemile Creek is extensively fished.

⑭ p.2-143 Table 2.1.2.15-5. Camper space must be assessed as many pipeline construction workers camp.

⑮ p.2-151 The housing of workers in Spread 5 will not be in Missoula. NTPC seems to think that workers will be housed in Plains and Thompson Falls. In fact many of them will camp along the route. This is also true of other spreads. This whole section should address the impacts to local camping areas. Experience along the Alaska pipeline proves this out.

⑯ p.2-153 "Police protection is generally considered adequate for present conditions." What about construction conditions?

The section on social conditions is inadequately researched and begs the question. Elk and deer cannot be asked for their preferences, but people can! Vast monetary and personnel resources have been spent on assessment of flora and fauna. The population along the pipeline route is a major resource which has not been properly studied.

There are no economic benefits to local populations. Indeed those unfortunate enough to have the pipeline on their property will lose economically.

⑰ p.2-160 Montana. A thorough study of the impact on the water structure of Ninemile and Sixmile valleys is necessary as the water structure is quite complex.

⑱ p.2-163 Table 2.2/2.13-2 is meaningless and the reason for its inclusion in the DES must be explained.

⑲ p.3-56, 3-57 Unpaved roads are as important as a fugitive dust source as is the actual construction site. This should be made clear.

⑳ p.3-59 Summary impacts to physical geology will be large in several places in ~~[illegible]~~ River crossings, places of potential slides (such as Siegel Pass) will suffer significant impact due to construction of ~~[illegible]~~.

Blocking or diverting of small surface drainages will be, in most cases, permanent unless the landholder corrects them.

㉑ p.3-60 The entire route through the Ninemile valley is right on top of an old, extensive fault. Any fault motion might cause a severe rupture.

㉒ p.3-61 Liquefaction studies need to be carried out along the alternate route. Slope instabilities of severe proportion are likely in the Siegel Pass and Frenchtown areas.

㉓ p.3-62 Mineral Resources. The entire Ninemile area is covered with placer claims, several of which are active. The proposed pipeline would traverse these resources.

Site specific disposal of rock material unsuitable for backfill must be addressed--especially in the Siegel Pass area!!

㉔ p.3-65 Spills. Aerial inspection every two weeks is not adequate for the potential of oil spills which could occur without being electronically detected. This is especially true during winter months and for inaccessible areas.

Erosion Losses. On page 2-116 manmade intrusions such as pipelines and powerlines would cause "erosion and scars", which contradicts the assumption on page 3-65 that "erosion loss would be normal..."

㉕ p.3-67 Aquatic Resources. "Ground water flow characteristics would not be significantly affected by construction of pipeline." This is not true and this should be properly addressed.

Hydrostatic testing procedures are not adequately explained in construction section of Chapter One. Adequate protection of the environment from contaminated hydrostatic water will not be possible if there is no independent inspection system.

Nothing is said in this section about the source of the water for hydrostatic testing.

Oil spill probability statistics are really meaningless because a statistic is not an impact.

㉖ p.3-70 Table 3.2.6-2, Maximum Potential Oil Spill. This table should include Ninemile, Sixmile, Houle, Roman, and Mill Creeks, as well as all the 21 tributaries to Ninemile Creek.

㉗ p.3-72 "There would be no significant impact resulting from test water discharge." This would only be true if test water is properly treated--will it be?

㉘ p.3-75 A site specific study of the accumulative effects of siltation resulting from construction must be done--especially for the Ninemile drainage.

㉙ p.3-80 Terrestrial Vegetation. The logging aspects of the construction process has not been realistically assessed especially on 2,835 acres of forest habitat in a 90-foot corridor. For example, how would slash be properly disposed of? How would merchantable timber be removed from the corridor?

"Associated with this loss of dominant overstory vegetation would be an expected increase in shrubs, grasses, and sedges, within the first year following construction." Not necessarily considering the disturbance to the area. Source of information?

㉚ p.3-84 Maintenance of right of way in general is not adequately addressed, in particular shrub and weed control. What type of "chemical control at approximately 5-year intervals" is planned for maintaining the corridor?

㉛ p.3-93 Operation Phase. No mention is made of increased hunting pressure resulting from a long straight corridor which would be easily accessible.

㉜ p.3-96 Visual Impacts Construction Phase. The assumption that "construction would be carried out in an orderly, technically proficient... manner" is not a realistic appraisal of this construction project. Therefore the whole visual analysis assumption is not relevant.

㉝ p.3-97 Support Facilities. All impacts of the construction of microwave and power facilities antecedent to the pipeline have not been considered at all in the text of the DES. These are major impacts and require adequate study.

㉞ p.3-101 A 30-by-40-foot cleared fenced area for block valves is not mentioned other than as a visual impact. These areas would be a major and diverse impact which should be considered in other sections of the DES.

CONT.

㉟ p.3-102 The spoils disposal problem has not been properly addressed. In addition there is the question of revegetation of spoils which tend to be sterile in nature.

㊱ p.3-103 Variable right of way discussed in this section needs to be considered in other sections of DES.

Table 3.2.12-1 Estimated Direct Impacts of Construction (in Acres). This table does not discuss indirect impacts such as access roads, spoils piles, material sites, etc.

Losses in agricultural production would be significant to individual producers especially in this area.

Will farmland designation be mapped before construction?

㊲ p.3-104 On revegetation of right of way, will there be weed control in range areas?

㊳ p.3-106 Where is Table 3.2.12-3 for indirect acreages affected on powerline corridors?

The Wilderness section is very confusing. How could there be any impacts on a wilderness since right of way would be denied through wilderness areas?

㊴ p.3-108 Road and Highway Traffic. Road damage would be significant on county roads, especially 410 commuting workers and 50 truck deliveries daily.

Partial road closures will not deal with construction realities on our rural roads.

㊵ p.3-109 That temporary access roads would be less than one mile in length is an unwarranted assumption, especially in forested and more inaccessible areas.

㊶ p.3-110 Table 3.2.13-1 New electrical system facilities required if the proposal is implemented. Because of the amount of acreage involved would not a separate EIS be required to assess impacts?

㊷ p.3-111 "Possible construction of new communications facilities is therefore not likely to cause significant impacts." This is in direct conflict with visual impact analysis in earlier part of this section.

The implementation of a cathodic protection system is not discussed. Does this involve above ground installations?

㊸ p.3-118 Experience shows that heavy use of either designated or undesignated campgrounds by constructions workers causes severe impaction.

㊹ p.3-119 Heavy housing impacts will also occur in western Montana.

㊺ "The addition of pipeline property to the tax base would increase property tax revenue and/or reduce effective levy rates." This statement does not consider increased costs to the taxpayer, especially those caused by damage to roads.

The general economic methodology used in the DES is totally unrealistic.

㊻ p.3-121 Housing. The previous section on recreation and campground use should consider statistics of Construction Worker Profile.

We question the statement that construction workers will not bring their own children.

㊼ p.3-124 Fire Protection. Rural volunteer fire departments will not necessarily respond to construction site fires. Rural volunteer fire departments respond primarily to dwelling fires. They are not trained or equipped for construction fires.

㊽ p.3-125 (Missing heading)

Section with heading missing is probably the most important section especially since it deals with people and the implications of the eminent domain law. No attention is paid to depreciation of property values which is certainly a major economic impact. This section should be thoroughly reevaluated.

㊾ p.4-2 "Revegetation of borrow areas is considered standard practice and was assumed in impact analysis reported in chapter 3." Does this apply to all borrow areas, or just U.S.F.S. areas? What are the specifics of the "revegetation" to be applied?

Re additional measure item 1.--What soil impact-reducing measures will be applied to all lands crossed?
Re additional measure item 3.--Where will the "offsite disposal" areas be located?
Re additional measure item 4.--From where will be water be drawn to water "after construction until vegetation is established"?

"Avoidance of known areas of potential slope failure is considered standard practice, and was assumed in the impact analysis reported in chapter 3." But, p.8-77, "Slope instability has been identified near Siegel Mtn...." and "Either of these geologic hazards (i.e. slope instability or liquefaction problems) could result in pipeline ruptures."

p.4-4 What revegetative measures will be taken on land to be crossed by the corridor given that this is an area of low precipitation (less than 20"/year), temperature extremes, and potential soil degradation?

"The NTPC proposes to locate the pipeline and related facilities to avoid vulnerable wildlife habitats." But, p.8-79 (re Ninemile Creek), "Impacts from additional removal of winter range by construction of the pipeline would increase dependence on the already heavily used winter range on national forests."
Depending on the final route chosen, the pipeline corridor has the potential of crossing up to two-thirds of key deer-elk winter range in the Ninemile-Mill Planning Unit (Fig. 14, Multiple Use Plan, Ninemile-Mill Planning Unit, U.S.F.S., 1976). There is also extreme danger of destroying areas of important summer forage for both wildlife and domestic livestock.

㊿ p.5-16 Construction impacts on ground water would be permanent in some areas and not temporary, as stated in the DES. This should be further researched.

(51) p.5-17 Construction schedules will necessitate stream crossing at periods other than low water which would result in serious sedimentation, etc.

(52) p.5-18 Table 5.2.8-1 Unavoidable Impacts on Vegetation. Mitigating measures could only be assured if environmental inspector is independent and has stop work authority.

(53) p.5-20 Visual Impacts. Siegel Pass and Ninemile segment of pipeline will result in a serious visual scar.

This project would not be a nuisance - to landowners in this area but rather it would be a disaster!

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(54) p.5-21 5.2.1.3:

1) Rather than "congestion" we would have traffic hazards along many parts of rural roads.

2) Truck traffic will (not might) cause significant road damage.

(55) p.5-22 Recreation Resources. Accessibility of corridor to hunting pressure would be impact on wildlife.

(56) p.5-23 Short term increases in population should also include western Montana as critical impacted areas.

Table 5.2-15-1.
Fiscal Capacity - Expenditures of local governments may not be compensated even after construction phase.

Loss of revenue to individual landowners is neglected. For the individual landowner pipeline construction is not a short term nuisance.

(57) p.6-2 "Once a utility corridor is established it tends to attract additional new utilities." The fact that this area of Montana could become an enormous energy corridor should be thoroughly assessed especially with regard to the cumulative effects.

The discussion of the abandonment phase of this project is pointless since a multible use corridor will certainly occur.

(58) p.6-3 The section on local adverse impacts does not consider long term property devaluation on private land.

"Minor pipeline leaks are expected to occur quite frequently throughout the life of the project."
What is a "minor" pipeline leak? If it's undetectable by the automatic leak detection system it could be up to 3 to 4 thousand bpd (p.1-31). How many days before detection?

(59) p.7-4 How can an "irretrievable change" be short term?

(60) p.8-77 "Construction of this alternate route segment would have relatively minor topographic impacts, primarily landscape changes and temporary drainage alteration." The following comments are addressed to the aforementioned "temporary drainage alteration":

-The most adverse impact of pipeline construction on aquatic resources would be in clearing and maintaining a 75' right-of-way. There is no question this would increase water temperatures. This subject is not addressed in the draft EIS. Removal of riparian vegetation would compound this problem, and would increase suspended sediments.

(61) -It is important to maintain original stream gradient at crossings after construction. This would help prevent stream blockage for migrating fish, prevent severe deposition or erosional areas from starting and accentuating. This matter was not discussed in the draft EIS.

(62) -Test water could be a major problem if taken from Ninemile Creek. Six cfs would probably dewater Ninemile Creek in low flow periods (U.S.G.S. Water Resources shows a mean minimum discharge of only 12 cfs for August 1977, for example). Also if this water was discharged into Ninemile Creek it could have serious impacts, particularly in late summer. Would pH be readjusted? What bacteriacide would be used, what concentration, and what impacts would this have on the stream? This subject has not be adequately addressed in the draft EIS.

(63) The probability of seismic activity is not necessarily low in this area.

(64) "Soil compaction from construction equipment would be moderate on the predominantly loamy and gravelly soils. Loss of productivity would be no greater than an estimated 5 percent and should return to normal in 2 years." "Blasting and excavating the pipeline trench through the shallow soils would increase the potential for profile mixing and dilution. Without careful topsoil segregation and replacement the natural soil fertility would be reduced by at least 10 percent and would be permanent." What is "moderate" soil compaction? What is the source of information for the figures "5 percent" and "10 percent" as quoted? What measures will be taken to prevent erosion due to paucity of vegetative cover during the estimated 2 years to "return to normal"? What measures will be taken to ensure careful topsoil segregation and replacement?

(65) p.8-78 Legal problems involved in taking water from creeks with full water rights assigned have not been discussed.

Two percent of streamflow means what? Over what time period?

"In the event of a pipeline rupture, oil would be carried to surface waters causing water quality degradation." Who or what agency would monitor pipeline impacts on aquatic resources? Preimpact studies? Construction impacts? Investigate the effects of spills?

(66) "The most important streams along this alternative route segment supporting fishery resources include the Clark Fork, and Little Blackfoot Rivers, and Siegel and Ninemile Creeks. Numerous tributaries to these streams are crossed."
Twenty-three streams are recognized for their sports fisheries value within the Ninemile-Mill Planning Unit (Fig. 6. Multiple Use Plan, Ninemile-Mill Planning Unit, U.S.F.S., 1976). The proposed pipeline will cross fifteen of these, not to mention severe

impacts on Ninemile Creek and Siegel Creek themselves. Further, the more precipitous streams tributary to Ninemile and Mill Creeks are believed to be home for the true westslope cutthroat trout (Multiple Use Plan, Ninemile-Mill Planning Unit, U.S.F.S., 1976).
What measures will be taken to protect these valuable resources?

(67) In general the impact on water resources has not been sufficiently studied especially in view of the fragility of the water resource structure.

(68) p.8-79 "Although the grassland range vegetation involves the greatest acreage disturbance the impacts should be relatively minor. Grassland could be restored and maintained at near present productivity shortly after construction."
Define "minor", "near present productivity", and "shortly".
How will restoration be accomplished?

(69) Re: big game winter range. "Construction during late summer would reduce impacts." And, "summer construction would reduce disturbance to waterfowl." In both cases, why?

(70) "Quantified wildlife studies are not available for most of the alternate route."
And this is an "impact" statement!?!

(71) p.8-80 According to the figures on p.8-77 the right of way in the Siegel Creek area would be 200 feet wide, not 90 feet wide.

CONT

(72) p.8-81 Transportation and Utility Networks. The passage of heavy equipment and workers would destroy Ninemile Road, presently a secondary county dirt road. No compensation would be made by NTPC; the county, through taxation, would have to pick up the cost.

(73) Recreation Resources. There are, in fact, a large number of hunters which use the Ninemile area. In addition the pressure of construction workers on campgrounds along Ninemile Creek would be very significant.

(74) Social and Economic Conditions. No mention is made of decreasing land values due to pipeline construction. Equally ignored is the long term damage resulting from establishment of this area as an energy corridor.

ADDITIONAL QUESTIONS TO BE ADDRESSED BY
THE FINAL E.I.S.

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(75) a 1. Where will pump stations be located?

b 2. What excavations will be required for sand, gravel, or borrow material from streams or flood plains? Detrimental erosion or channel change at flooding due to this?

c 3. Will there be on site burial of refuse or petroleum based products?

d 4. Will spoil banks along the trench be lowered to approximate the original contour in order to preserve the natural ground water patterns and thus minimize postconstruction effects?

e 5. Have ditch blocks been considered as a means of deflecting water from the pipeline ditch thereby eliminating serious erosional problems? This is not mentioned in the DES.

GENERAL CONSIDERATIONS

Several weaknesses have become apparent as we analyzed the DES:

(76) 1. Two thirds of the proposed route falls on private lands. Yet this fact is ignored totally--as if people were not a major resource. Such impacts as property values are not addressed at all, and other significant impacts are dismissed as nuisances. In addition, the implications of eminent domain, especially as it would apply to access, has not been included. The opinions of local landowners, as well as the general public, has not been sought.

(77) 2. One major consequence of the pipeline is the establishment of an "energy corridor" which would complete the destruction started by the pipeline. Fragile areas such as Ninemile, Siegel and McDonald Passes, and the like would be destroyed. An independent study of the cumulative effects of energy corridors is necessary.

(78) 3. Water resources in general, and hydrostatic testing effects in particular, have been inadequately covered. Reams of statistics cannot cover basic ignorance. Vague promises by NTPC should not be confused with fact.

Just how far can water from the Ninemile Creek undergo planned usage as proposed by the DES? To begin with, the normal flow will be disrupted by the simple fact of trenching under 15 tributaries. Additionally NTPC proposes watering during construction to minimize soil loss. Next comes withdrawal for purposes of hydrostatic testing. And finally, watering after construction until vegetation is established. The applicant may find inspection of the U.S.G.S. Water Resources quite enlightening--BLM might too!

(79) 4. Discussion of the need for independent quality control and surveillance is necessary. The realities of pipeline construction can be easily ignored as witnessed by the Alaska pipeline experience.

(80) 5. Landowners in the vicinity of energy corridors will have to pay three times for corridor establishment: as a consumer of the products involved; in the form of losses, especially of property value; and again in the form of taxes to repair damages to public facilities. Momentary blandishments such as inadequate lump sum payments will not compensate the landowner.

(81) 6. The Ninemile-Mill Planning Unit has a history of extreme fire danger due to unnatural accumulation of fuels compounded by debris from logging, thinning and clearing. This threatens both the forest ecosystem and homes and property scattered throughout the planning unit (p.11, Multiple Use Plan, Ninemile-Mill Planning Unit. U.S.F.S. 1976). What measures would be taken to minimize fire danger during construction of the pipeline and, given the highly volatile nature of freshly leaked oil, to prevent conflagration during spillage?

(82) 7. How much irrigated agricultural land will be disturbed? A detailed assessment of impacts is certainly in order on this point. Will construction proceed during the irrigation season?

(83) 8. Finally, what must be considered more seriously are the alternatives to the Northern Tier Proposal. The BLM DES discusses three pipeline proposals which move Alaskan crude oil to the Midwest. These are the Foothills, Kitimat and Transmountain Reversal proposals. We question the small amount of time which has been spent to study these proposals, and we also question the validity of their "alternative" status when they are apparently inactive proposals at this time. (Again, this DES is antiquated and therefore incapable of accurate assessment of the project proposed.)

We feel the most viable proposal appears to be routing the pipeline along the same right of way as that proposed for the natural gas pipeline from Delta Junction, along the Alcan Highway, to Edmonton, Alberta.

(84) Three additional alternatives which have not even been considered and yet deserve serious attention are:

a) Reducing Alaskan oil flow to an amount that can be utilized on the West Coast.

b) Retrofitting West Coast refineries to handle the Alaskan crude oil thereby eliminating the need to import "sweet" oil from foreign sources to obtain the mix required by existing refineries. After all, energy independence is the national goal behind this DES--no?

c) And, if we're not after energy independence (i.e., if we're going to import foreign "sweet" oil), why not ship the Alaskan crude to Japan?

Obviously, the missing ingredient in this DES is time--time for proper preimpact studies, construction impact studies, and studies of postconstruction impact possibilities, as well as the time that is essential for accurate analysis of all existing alternatives to this proposal.

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Star Route
Huson, Montana 59846
March 29, 1979

BLM-Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah Street
Portland, Oregon 97232

Gentlemen:

Enclosed you will find additional comments and questions relating to the Draft Environmental Impact Statement issued by your agency for the proposed Northern Tier Pipeline project. These comments were prepared by Greg Prescott a consulting geologist who lives in the Nine-Mile area.

Once again we wish to express grave concern with the fact that this draft Environmental Impact Statement is both out-dated and inappropriate to the pipeline route as presently proposed by Northern Tier.

Thank you for the opportunity to express our concerns.

Sincerely,

Jan Raepe, Chairman
VALLEYS PRESERVATION COUNCIL

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Nine Mile Rural Route
Huson, Montana 59846
March 29, 1979

*Critique of Geologic Sections*
*of B.L.M.'s Draft Environmental Statement*
*on N.T.C. Proposed Crude Oil Pipeline*

*Prepared by Greg W. Prescott*
*Consulting Geologist*

*GENERAL STATEMENT:*

*The writer is a professional geologist (Idaho Registration Certificate No. 411) with 12 years working experience in the Pacific Northwest involved with mineral exploration. After careful study of the subject Environmental Statement, I find in my professional opinion a number of obvious omissions, inaccuracies and misleading analyses of the geologic factors and associated impacts related to the proposed pipeline construction by N.T.C. No attempt was made to analyse the on-shore facility proposals and what follows is limited to the design features of the pipeline and the potential geologic hazards encountered along the two-mile wide study corridor.*

*SPECIFICS:*

① *The statement on p. 2-52 and p. 2-53 of the E.S. that only 13 surface faults are identified along the entire 1500+ mile corridor of which only three are recognized as active, is dangerously inaccurate in terms of a data base to design safety features and align the pipeline route. The detailed geologic data currently available for study along the corridor is voluminous and it is obvious that the geologic contractor, Furgo, Inc., for the B.L.M. statement has either ignored and/or dismissed as irrelevant this information base, since many times this amount of active and/or potentially active faults are recognized by federal, state and private geologic organizations.*

*A prime example of this type of omission is the 80+ mile pipeline segment from Thompson Falls, Montana to and beyond Missoula, Montana. No mention is made of any plans to deal with the existence of two major, potentially active faults which parallel and cross and recross the proposed pipeline alignment throughout this entire segment. These faults, the Hope Fault and Ninemile Fault (see U.S.G.S. Prof. Papers 346,719 and 866) as well as numerous subsidiary faults pose a real threat to the integrity of the pipeline over this 80+ mile segment. Granted no recent activity has been demonstrated along these faults in recorded times, but there is general agreement that they are definitely potentially active. Since the proposed route lies within the corridor of influence of these structures for over 80 miles of its length, it would seem prudent to allow for check valves, flex joints, special bed or other safety design features of the proposed construction to compensate not only for catastrophic ruptures, but potential passive creep along the faults.*

CONT

② *The Geologic hazards identified in Section II of the statement concentrates only on the catastrophic potential of the geologic environment. Consequently a serious omission of dynamic, yet passive, geologic forces has been made in the assessment of possible hazards and impacts along the route. Surface and/or soil creep is a geologic hazard not discussed in the proposal. Passive fault movement is a geologic hazard not mentioned by Furgo, Inc. in any of the sections of the statement. Dynamic subsidence and/or emergence on a regional scale in the various geologic provinces and the potential resultant stress gradients imposed on a possible pipeline, is also ignored in the geologic treatment of the proposed alignment.*

③ *The subject of swelling clays as a geologic hazard is dismissed on p. 2-52 as having a minimal impact and not a serious threat to the pipeline. Also it is evident in the statement that no specific plans, procedures, or guidelines are proposed or under consideration as to how unsuitable trench excavated fill is to be disposed of. I submit that this is a significant oversight by the pipeline planners. A substantial portion of the proposed route crosses areas which have high clay content in soils, glacial deposits and other alluvial materials in addition to the areas of Eastern Montana mentioned in the E.S. Should these materials after excavation be improperly handled, a very serious impact problem could arise in the form of stream silting. A specific example is the proposed route through the Nine Mile Valley where high clay content glacial till would be encountered. Neither the clay nor the boulders excavated in this section would be suitable fill material. Certainly this material once disturbed, could not be left exposed to surface runoff, yet no plans are mentioned in the draft E.S. to deal with the problem.*

④ *In the writer's opinion the subject of mineral resources is mistreated in the E.S. It was stated that no active mines exist within the two-mile wide study corridor. This fact says nothing as to the discovery potential or the near future viability of currently recognized mineral deposits along the corridor. As a specialist in mineral exploration I can attest to the fact that a very high probability exists that the currently proposed two-mile wide study corridor contains as yet undiscovered viable mineral deposits. Moreover I am confident that given careful study of the geologic data base, a satisfactory realignment of certain pipeline segments could be achieved which would minimise the interference created by mineral withdrawal along the corridor. That a study of this type was not made by the geologic contractor, Furgo, Inc., is quite evident and should be rectified before final alignment is made. A specific example of disregard for potential mineral resources is to be seen in the pipeline's alignment over the Kennedy Creek Basin in the Nine Mile Valley in Montana where substantial deposits of gold-bearing glacial till are present and estimated to contain roughly $50,000,000.00 in gold by the U.S.G.S. (see U.S.G.S. Bulletin 470).*

*CONCLUDING STATEMENT:*

*As a geologist it is obvious to me that the current treatment of the geological inputs to the N.T.C. pipeline proposal is grossly simplified and inadequate to yield the detailed information necessary for engineering, alignment and safe construction. Yet I see no overriding geologic factors which would dictate rejection of building a pipeline roughly along the proposed route. I suggest strongly that the inadequacies as above described be rectified by more careful and detailed study before a final pipeline design and alignment is approved.*

*Respectfully Submitted,*

*Greg W. Prescott*

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ADDITIONAL COMMENTS AND QUESTIONS RELATIVE

TO BLM DRAFT ENVIRONMENTAL STATEMENT

Prepared by Greg W. Prescott
Consulting Geologist

5 Proposed route disregards topographic grain. In a vertical dimension the current proposed pipeline route exhibits a highly erratic alignment due to the crossing of a multitude of minor and major topographic features. At each reversal of grade, hilltops and valley bottoms, the potential for line failure is increased due to the resultant stress points thus created. Among the undesirable features of a highly fluctuating pipeline grade are:

1. Difficulty of construction leading to increased chance of mistakes.
2. Local high and low pressure points in the line which may exceed design margins during surges, or result in fatigue failures from constant wear, limit operation over the lifetime of the line.
3. The necessity to anchor the line to prevent accumulative lateral stress.
4. Stabilization difficulties during and after construction of soils.

6 The proposed route avoids agricultural land in favor of overland alignment. The current proposed route avoids agricultural lands where possible and favors heretofore undisturbed land. This approach to pipeline routing is highly undesirable from a restoration standpoint and in terms of total disturbance of the environment. By constructing the line across agricultural land where possible, nearly 100% restoration could be practicable achieved, stabilization and minimal visual impact practices are the only feasible restoration options now contemplated within the forest lands route.

Preferred routing guideline recommendations. It is my opinion that the safest, least expensive, minimal impact pipeline route would be achieved by incorporating the following pipeline routing guidelines:

1. Routing the pipeline along existing right-of-ways such as railroads, freeways, state and county highways and roads, existing pipelines and in some cases existing powerlines.
2. Routing the pipeline through agricultural lands where possible instead of forest lands.
3. Where overland or cross-country routing is necessary, contouring alignment or other forms of grade fluctuation minimization should be employed. Note: Clearcutting in this case along the right-of-way should be suspended in favor of permanent access roads along the alignment to facilitate on-the-ground inspection of the line instead of a fly-by inspection as is now proposed.

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PHONE 426-3577
AREA CODE 206

JAMES E. CONNOLLY
DIRECTOR

MASON REGIONAL PLANNING COUNCIL

P.O. BOX 186 • 5TH AND BIRCH
SHELTON, WASHINGTON 98584

March 29, 1979

Mr. H. William Storms, Director
Bureau of Land Management
700 N. E. Multnomah Street #1250
Portland, Oregon 97232

CERTIFIED MAIL

Dear Mr. Storms:

Thank you for the opportunity to review and comment on the Draft Environmental Statement - Crude Oil Transportation System as proposed by the Northern Tier Pipeline Company.

The attached comments address the draft Environmental Statement and the potential impacts of the proposed pipeline on Mason County. The comments submitted cover five general categories, which are: physical or biological impacts from construction, operational physical or biological impacts, pump station construction and operation impacts, socio-economic or transportation impacts of construction crews and equipment during the construction period, and finally, socio-economic implications of operation line failures.

We offer these comments to you on behalf of the citizens of Mason County. If you should have questions, please don't hesitate to call.

Sincerely,

James E Connolly

James E. Connolly
Planning Director

JEC:vm
Enclosures
CC: Board of Mason County Commissioners
City of Shelton Commissioners

P. S. The attachments were inadvertently omitted from yesterday's letter.
Please excuse the oversight.

J.E.C.

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CONT

The potential impacts of the proposed Northern Tier Pipeline through Mason County fall into 5 main categories:

- Physical or biological impacts from construction
- Operational physical or biological impacts (oil leakage or spills)
- Pump station construction and operation impacts
- Socio-economic or transportation impacts of construction crews and equipment during the construction period
- Socio-economic implications of operation line-failures or related operation damages

Other impacts do exist and will be described below. However, these 5 areas are of prime concern to the county. The Bureau of Land Management (BLM) Draft Environmental Impact Statement (EIS) published in February 1979 does not address any one of these five potential impact categories in sufficient detail to be meaningful at the county level. While it may be argued that the EIS is national in scope and should not contain excessive detail, the purpose of the EIS is to provide necessary data for decision making based on all geographical areas of impact. The potential impacts on Mason County are substantial as enumerated below.

I. Description of the Proposed Action

1 (Pages 1 - 19)
While the only major highway to be crossed in Mason County is State Highway 108, many of the small roads leading west from Hood Canal are single entry roads which are the sole connection of goods and services for local residents. Blockage of these roads during construction would cause serious problems. In some cases, due to topography, it would be extremely difficult to reroute the road while construction took place.

2 (Pages 1 - 24)
The document identifies 2 major rivers in Mason County, the Skokomish and Hamma Hamma. However, Mason County studies have identified 14 more rivers and streams that may be significantly impacted by the proposed action.

Protecting the freshwater and marine resources of the county is a major concern. Aquaculture habitat, spawning grounds, and shellfish resources will be impacted in all the streams and rivers listed below:

Lilliwaup Creek (estuarine wetlands, anadromous fisheries, wildlife, fisheries)

Jorsted Creek (estuarine wetlands, anadromous fisheries, bald eagle habitat, etc.)

Eagle Creek (shellfish)

Finch Creek (fisheries)

Goldsborough Creek (City of Shelton water supply)

Cosnell Creek and Isabella Lake (fisheries, wildlife, wetlands, recreation and esthetics)

Skookum Creek (tidal wetlands, shellfish, waterfowl, wildlife)

Kennedy Creek (tidal wetlands, shellfish, waterfowl, wildlife)

Enetai Creek (fisheries)

3 The document locates mainline values only on the pipeline where it crosses the Skokomish and Hamma Hamma Rivers. Block and check valves must be located on every stream and river crossing to help protect them from possible oil spill contamination and the resulting deterioration of fisheries resources.

4 (Pages 1 - 27)
The location of the pump station in Mason County is referred to as T-20-N, R-4-W, Section 36, which would place it west of Shelton. This does not agree with the location shown in the Map Addendum, which places it at the western end of Isabella Lake. It is not certain which location is in fact intended.

5 (Pages 1 - 31)
No mention is made of pumping station dimensions. It appears that these stations could occupy 5 or more acres of land, causing significant impacts when placed at the upstream end of an important lake.

6 (Pages 1 - 41)
The location of construction staging areas in Mason County is not well defined. Any staging site would be a focus of widescale construction impacts including erosion.

7 (Pages 1 - 43)
The description cites a maximum of 480 construction personnel. However, this does not seem to include the 840 persons (mentioned later in the report) who would construct the pump station.

8 (Pages 1 - 46)
The document recognizes that construction times at major river crossings (the Hamma Hamma and Skokomish) should reflect a designation made by the appropriate state agency. The topographic, hydrologic, and biologic characteristics of the streams and rivers are not uniform. Therefore, scheduling of pipeline construction at all stream and river crossings must be based on the specific characteristics of that waterbody.

9 (Pages 1 - 47)
The document includes an incomplete section on clean up and restoration after construction of the pipeline. Soil suitability in Mason County is extremely limited for revegetation efforts due to soil types, steep slopes, and lack of sufficient soil. Therefore, restoration efforts must include revegetation monitoring to protect soils from surface water erosion and resulting siltation.

10 An inspection team, made up of representatives from appropriate state and local agencies and the Northern Tier environmental representative, should be empowered to monitor the revegetation efforts to insure compliance with environmental regulations.

11 (Pages 1 - 56)
The document summarizes the contingency plan to be prepared for the pipeline system prior to operation. Personnel and spill containment and cleanup equipment located at each of the district offices, (Spokane is the district office in Washington State), would normally reach the site of any leak in 1 - 6 hours, depending on the location of the leak and weather conditions.

The contingency plan as proposed is inadequate. Obvious environmental disaster would result if an oil leak were to occur anywhere along the pipeline corridor. More details must be presented on what equipment, personnel and financial assistance is to be given to Mason County.

12 (Pages 1 - 56)
The document summarizes additional measures proposed for environmental protection. Three concerns that are not addressed are listed below.

1) Routing the pipeline away from aquifers supplying the City of Shelton watershed area or that feed directly or indirectly into Oakland Bay/Hammersley Inlet.

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2) Routing the pipeline away from Totten and Skookum Inlets to protect Olympia and Pacific oysters and Pacific hardshell clams habitat. Based upon five year averages of total production in Puget Sound, Mason County aquiculture accounts for 93.5% of all Olympia oysters, 60.1% of all Pacific oysters and 97.1% of all Pacific hardshell clams.

3) Routing the pipeline away from the sensitive geologic/soils areas located near the Hamma Hamma River and John Creek.

13 (Pages 1 - 58)
#25 of measures proposed for environmental protection is not effective. Financial aid has not been received by county and city agencies carrying out Pipeline Impact Studies. The Northern Tier Company has not helped with the identification of fund sources for the impact analysis study.

II. Description of the Environment.

14 (Pages 2 - 52)
The document does not contain sufficient baseline data on geologic hazards in general and on seismicity specifically. Only two faults are identified in Washington State, one of them located in Mason County. The Puget Sound Basin is the area of most higher intensity earthquakes in Washington State. (Bulletin of the Seismic Society of America; January 1953) U.S.G.S. open report 78-426 shows various inferred structures (faults, principle folds and large scale quaternary deformation) either parallel to the pipeline or possibly intersecting the route. High intensity earthquake activity in the Puget Sound Basin is very probable in the near future. (University of Washington Master Thesis - 1974)

A complete baseline study to inventory seismic activity has not been carried out by Northern Tier Company. Completion of an adequate geotechnical survey is required prior to any routing decision in Mason County.

15 (Pages 2 - 61)
The Hamma Hamma River crossing is in an area near or in tidal and freshwater wetlands. Tidally influenced sitka spruce-dominated swamps exist in this area and may exist at the proposed crossing location (see NEC 1979). The crossing at the Skokomish River occurs in an alder-willow swamp wetland. The existence of these wetlands at or near proposed crossing locations should be mentioned.

16 (Pages 2 - 80)
Jorsted and Eagle Creeks also have relatively high levels of salmon and general fish use at their lower end (see NEC 1979).

17 (Pages 2 - 96)
Bald eagle sitings are mentioned at the Hamma Hamma River and Lilliwaup Bay. However, these birds probably also use several of the more minor creeks in northern Mason County for either hunting or nesting.

18 (Pages 2 - 150)
The draft EIS fails to recognize the Skokomish and Squaxin Island Indian Reservations.

19 (Pages 2 - 152)
The document assumes that most construction workers will not be accompanied by their children during the school year. Northern Tier Pipeline Company should provide Mason County with pre-construction baseline school attendance/capacity data. This data will be used to measure future impacts of project related student immigration if this assumption proves to be invalid. Pre-impact payments or reimbursement plans for school impacts must be identified by the Northern Tier Pipeline Company.

20 (Pages 2 - 159)
The document states that Washington's rivers will become "intensely directed and controlled" by the year 2000. It should be pointed out that this is unlikely on the Olympic Peninsula portion of the route where water usage will likely remain directed toward recreation and natural area use.

21 (Pages 2 - 164)
The draft EIS makes no mention of population impacts from the Satsop Nuclear Power Project located in Grays Harbor County, Washington. Construction workers reside in Mason County and commute to that site.

III. Impacts of the Proposal.

22 (Pages 3 - 13)
The document states that hydrologic characteristics of streams crossed by the pipeline may return to preconstruction conditions in most cases. Considering the steep bank and unstable soil conditions present in Mason County, this statement is highly suspect.

23 (Pages 3 - 59)
Excavation impacts on many of the sensitive streams in the Mason County portion of the corridor could be major impacts for fish and wildlife resources rather than minor, short-term impacts as stated in the document. Construction in many of the V-canyons could completely block and disrupt these streams. (See NEC 1979 for detailed discussion of these effects.)

24 (Pages 3 - 61)
Although the document identifies the active Saddle Mountain fault in Mason County, it fails to recognize potentially active faults or sensitive geologic areas in the county. Since the Puget Sound Basin has been identified as a major geologic risk zone the Northern Tier Pipeline Company must comment on the geologic hazards anticipated with the presence of these inferred structures shown on tectonic map of the Puget Sound area. The draft EIS states that the potential for ground surface rupture as well as an oil spill resulting from a pipe rupture would be high and could damage approximately .75 miles of pipeline. Northern Tier must revise this estimate to reflect increased seismic potential in Mason County.

25 (Pages 3 - 62)
Agriculture accounts for 10% of the existing land use along the 2 mile-wide pipeline corridor in Mason County. Approximately 6,067 acres of farmland are located within the pipeline corridor. Approximately 3,801 acres of potentially productive agricultural soil (capability class 2 and 3) are located from the proposed pipeline route toward the shorelines of Hood Canal and Puget Sound.

The effects of a cronic oil leak on soil productivity would be severe. Detection of a leak too small to be located by remote sensing equipment would be overlooked until it was seen and stopped. As much as 3,540 barrels/day, assuming a through put of 709,000 barrels/day, could be spilled without detection. Northern Tier Pipeline Company must install leak detection devices at points along the pipeline to reduce spillage volume near agricultural lands. Northern Tier must also agree to reimburse property owners along the pipeline route for proven pipeline related damage.

26 (Pages 3 - 67)
Impacts on water quality are not likely to be short-term, lasting less than one month, as stated in the document. Sediments will in many cases cover spawning beds and work into the gravels, filling crevices used by anadromous fish for egg deposition.

27 (Pages 3 - 72)
The impacts on fisheries in Mason County could well be major rather than a minor impact as described in the document.

28 (Pages 3 - 75)
The document implies that sediment will remain trapped in spawning gravels for less than one year and that this will affect only one year class of fisheries resources. The first portion of the statement may not be true and has not, to our knowledge, been tested under similar hydrologic conditions.

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Secondly, destroying one year class of salmon may cause severe damage to the total population utilizing many of the smaller creeks, since salmon generally migrate to the same stream.

29 (Pages 3 - 78)
In addition to the list of ways in which the document states fish may be affected by an oil spill, there will probably be indirect effects resulting from the destruction of wetland habitat at the stream mouths (which is of critical importance to the juvenile rearing stages of anadromous fish).

30 (Pages 3 - 101)
The document does not recognize the impact a pipeline accident would have on watershed/aquifer regions. Mason County is dependent upon watershed systems located within the pipeline corridor for its water supply. There is neither a sufficient baseline inventory of such aquifer recharge regions nor analysis of effects of an oil pipeline crossing over municipal water supplies. Contamination of water supplies is unacceptable to Mason County.

31 (Pages 3 - 102)
During the 1940's, I.T.T. Rayonier disposed chemical wastes in and around Goose Lake in Mason County. The practice of dumping toxic wastes has since been discontinued, yet the effects of this action may have some unidentified adverse impact on the oil pipeline. Northern Tier should investigate the potential degradation of the pipeline before final routing decisions are made.

32 (Pages 3 - 108)
The statements in the document regarding recreation and pleasure boating are not necessarily true for Mason County. Construction effects or oil spill on Hood Canal could have a significant effect on fisheries, shell-fish harvesting or pleasure boating.

33 (Pages 3 - 108)
Construction impacts along U. S. Highway 101 would be highly significant, particularly with the increased traffic volumes which will occur in the next several years due to the collapse of the Hood Canal Bridge. There is no alternative route in this area. Also, construction along Hood Canal will be difficult due to steep slopes and unstable conditions. Construction in Mason County will undoubtedly take longer than the one month period quoted in the document. Northern Tier must reimburse the county for any repair, enlargement, or modification of existing roads and meet local requirements when building new roads.

34 (Pages 3 - 109)
There is no mention in the draft EIS of the impact the project will have on the Shelton Airport. Officials plan to expand the facility and the only area for growth is into the pipeline corridor.

35 (Pages 3 - 109)
Construction or roads to carry construction equipment could be a major impact in the steep, unstable mountain slopes along Hood Canal. Detail on this is completely lacking in the EIS.

36 (Pages 3 - 112)
Recreational activity along Hood Canal is an important part of Mason County's economic base. This activity will be highly affected during construction by road blockage and the expected influx of workers and their families.

37 (Pages 3 - 113)
Impacts on Isabella Lake due to pipeline and pump station construction could be direct impacts of a major significance.

38 (Pages 3 - 119)
Apparently, calculations of workforce expected in Mason County are based on pro-rating construction workers per lineal mile of pipeline. Since the terrain is very difficult in the Mason County section as compared with other counties in this spread (particularly Clallam and Thurston), numbers of workers and length of construction time shown in the tables is probably low. Actual numbers and associated impacts can be expected to be considerably higher than shown.

39 (Pages 3 - 122)
It is not clear whether the pump station work force (which is considerable) appears in Table 3.2.15-3. If not, this would substantially increase population.

40 (Pages 3 - 124)
The document does not recognize a method for renumeration for impacted road services, police and health services, emergency tactical teams, and rural fire district teams in Mason County.

41 (Pages 3 - 125)
Economic and operational strains would be intense, particularly for small businesses along Hood Canal which are not set up to handle large numbers of transient workers.

IV. Mitigating Measures Not Included In The Proposed Action.

42 (Pages 4-1 - 4-10)
The document does not recognize alternative design of the pipeline where deep canyons exist and unstable soils result. V-shaped canyons pose particular construction problems in that no floodplain alongside the stream is available for staging construction equipment, or stock piling excavated material. The most significant construction impacts will be caused from erosion and excavation. These impacts can be reduced in steep sided V-canyons with trestles over riverbeds and trestles over narrow canyons. At least 4 streams in Mason County would benefit from the use of trestles; Whiskichek, Sund, Miller, and Finch. In trestle areas, a collection through below the transmission could be used to divert any oil leakage back to holding ponds outside of the river floodplain.

The document does not recognize that the pipeline must be designed to withstand an earthquake of such duration and intensity as is likely to occur in the Puget Sound Region. The EIS should discuss mitigative measures for the streams along Hood Canal, including the installation of block and check valves at creek crossings for Jorsted, Eagle, Lilliwaup, Finch, Goldsborough, Cosnell, Skookum and Kennedy Creeks. All of these streams contain important county resources. The mitigative measures which are discussed need to be less vague, particularly construction timing in relation to salmon. Crossings should also avoid wetland areas and spawning beds.

The document does not recognize the advisability of locating the pipeline crossing of the Hamma Hamma River and John Creek upstream of the sensitive geologic/soils area. Potential faults are located all along the pipeline corridor and this inferred fault is of particular concern to Mason County.

The document does not recognize the need for baseline data on the location of ground water aquifers which supply municipal water needs. The applicant could prevent water contamination from oil spillage by locating the pipeline away from these environmentally sensitive areas.

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㊷ The document does not recognize the need for revegetation monitoring enforce restoration efforts following pipeline construction. Especially in sensitive soils and slope areas, the revegetation followup would help mitigate impacts of erosion and resulting siltation.

The document does not address the issue of financial remuneration, liability and responsibility for action and mitigation.

The draft EIS does not recognize that a firm construction schedule is needed to alleviate impact identification problems and allow for proper lead-time for the planning of mitigations.

Map Addendum

㊸ The map addendum does not identify aquifer and watershed regions, or sensitive soil/geologic areas. The Skokomish and Squaxin Island Indian Reservations are not shown on the maps.

(Page 20)

㊹ The descriptions of critical resources impacts at the Hamma Hamma River and Annas Bay are generally complete. However, abundant harbor seal haul-out areas are also present at Annas Bay (Skokomish River). Additionally, salmon resources are significant enough in these areas to be emphasized over general fisheries resources.

(Page 20)

㊺ Since many of these resources listed for the Hamma Hamma and Annas Bay are present in some of the major creeks (See Evaluation of Norther Tier Oil Pipeline Through Mason County, Washington, Northwest Environmental Consultants, 1979) such creeks should be listed here as "critical" or at least "significant."

(Page 77)

㊻ The map near Pump Station #2 shows the area as critical for waterfowl. In fact the northern end of Isabella Lake is highly critical for fish, wildlife and is a high quality aquatic ecosystem.

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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
West Technical Service Center, 511 NW Broadway, Rm. 510, Portland, OR 97209

March 30, 1979

Mr. A. K. Leonard, Project Manager
Northern Tier E.S. Team
Bureau of Land Management
Room 1250, Lloyd Building
700 NE Multnomah Street
Portland, OR 97232

Dear Mr. Leonard:

The Soil Conservation Service has reviewed the Draft Environmental Statement, Crude Oil Transport Systems and has the following general and specific comments.

General Comments

1. The draft appears very comprehensive. However, the document would be considerably strengthened if the effects of the project on land use and cover along the pipeline were more comprehensively evaluated and displayed.

① For example, throughout the report the loss of production from the affected lands has been mentioned, but not quantified; e.g., page 5-13 (5.2.5 soils). "Soils in the right-of-way would produce nothing during construction" and page 5-20 (5.2.12 land use). "Across agricultural ② lands, construction activity would preclude production for at least one season on approximately 6830 acres of cropland and improved pastureland. The subsequent years productivity might be reduced by 5-10 percent assuming proper double trenching effectively segregates and replaces top soil." We strongly suggest the impacts of this loss of production be quantified in economic terms.

③ 2. The statement does not clearly discuss to what extent conservation systems will be altered, severed, or suffer blocked outlets.

④ 3. The statement does not clearly indicate that enduring soil and water practices are to be installed and maintained. Segregation of top soil during construction is discussed but no mention is made of stockpiling top soil for future use.

⑤ 4. There is a need to address possible erosion or erosion effects that may occur on adjacent lands when the damage(s) may be induced by pipeline construction.

⑥ 5. It appears that the environmental impact statement has identified the potential geologic, soils, erosion, and other related problems that may occur, but it should also address all the remedial measures, if any, to counteract these potential hazards. For instance, revegetation of the soil disturbance along the pipeline route may not always suffice on steeper slopes. What other alternative soil erosion measures would then be used?

⑦ 6. Do the efforts for controlling soil erosion, etc., apply only to the original entry, or to subsequent entries under the easement authority?

CONT.

⑧ 7. Many erosion control practices that may be needed, such as diversions, water bars, and erosion control structures, are not identified or discussed in the environmental statement.

⑨ 8. For that reach of the pipeline for which prime and unique farmland data is available, the draft environmental impact statement should display any prime agricultural lands that may be affected by pipeline construction. Impacts on these prime agricultural lands should be discussed.

⑩ 9. There should be some provision made for follow-up after construction for 5 to 10 years to determine if grass seedings, structures, etc., are performing properly to control erosion and prevent pollution.

10. Sharptail grouse dancing grounds are addressed; however, no proposal for avoidance of these grounds is recognized although construction adjacent to these grounds would only be a temporary disturbance.

a 11. We recommend the route south of Coeur d'Alene Lake rather than the one crossing the Spokane-Rathdrum aquifer. We recommend also the route over Jackass Pass rather than the one at the North Fork of the Coeur d'Alene River, which would require 24 river crossings in 23 miles.

⑪ 12. The material sent in from the Coeur d'Alene and St. Maries SCS field offices in Idaho during earlier planning is still pertinent as to the designated route and does not appear to be reflected in the E.S. This data covered impacts on erosion, land use, cover, crop, pasture and forest production, conservation practices, stream crossing, and habitat effects. Other field offices that sent in similar information had the same comment.

⑫ 13. There is also a concern about scattering noxious and other type weed seeds. The pipeline route goes through heavy infestations of goatweed, leafy spurge, dalmation toadflax, whitetop, and spotted knapweed. Utility corridors are ideal routes for weed infestations because seed is brought in on the earthmoving equipment and other vehicles.

⑬ 14. The area in western Montana including the route from Thompson Pass through Prospect Creek Canyon and up the Clark Fork River from Thompson Falls to Plains (alignment sheet No. 9 in the map addendum) is a very fragile and hazardous area. It is felt that resource concerns in this area have not been adequately covered in the environmental statement.

⑭ 15. At some stream crossings it is indicated that no permit is required. Example, Thompson River near Thompson Falls, Montana, on alignment sheet 9, pages 90 and 91 in the map addendum (designated by No. 58). There may not be a requirement for a U.S. Corps of Engineers permit, but because of state law a permit may be needed for the Montana Streambank Preservation Act through local conservation districts.

16. Montana water use permits for using local water for testing, etc., may also be needed and may be difficult to obtain during certain times of the year.

17. There appears to be some concern that proper consideration be given for co-location with other proposed utility corridors, such as the proposed electric power transmission system (the Colstrip project).

⑮ 18. Because of recent change in the pipeline route in western Montana, the information (soils, crops, etc.) originally submitted to BLM is no longer valid. The new route will encounter more stream crossings, soils needing more erosion control practices, and more difficulties in establishing vegetation.

⑯ 19. The Operation and Maintenance portion does not include many of the conservation practices that are to be applied. For example, because of the difficulty of establishing vegetation on some of the soils and the possibility of failures, follow-up work will be needed as well as maintenance of these conservation practices.

Specific Comments

⑰ 1. Page 1-46 - This page partially addresses maintaining the integrity of wetlands. However, pages 5-18 and 8-83 indicate that wetland loss could or would occur. This appears to be contradictory and, if so, should be explained.

⑱ 2. Page 1-47, paragraph 5 - Should be changed to provide for appropriate state laws on surface mining reclamation rather than just guidelines.

⑲ 3. Page 2-10 and 2-11, Seismicity - The proposed tanker unloading facilities, the submarine pipeline, and the off-shore storage facilities would be critical structures in case of a potential damaging earthquake. In view of the location of these structures being in a seismically active zone (risk zone 3) and the close proximity to soils subject to liquification and land instability, it would seem necessary that a detailed geological and engineering soils study be completed. The results of the study would assist in installing the needed design features to be incorporated into the proposed structures.

⑳ 4. Page 2-12 - In the second paragraph under 2.1.15 Soils, several soil series are mentioned as major soils. Only one is identified in the legend. This seems inconsistent to discuss Bellingham, Dick and Rifle as major soils and to not show them as a component of a mapping unit.

㉑ 5. Page 2-12, sixth paragraph, 2.1.15 Soils - There is a very questionable statement made on the geology. This should be checked out.

㉒ 6. 2.1.2.5. Soils (page 2-54) - Some clarification is needed as to just how much of the pipeline route is on land where detailed soils information is available. For much of the pipeline route this detailed soils information is not available. Prime farmland, for example, cannot be identified without this detailed soils information.

㉓ 7. Page 2-55, Soil Series and Table of Soil Characteristics - The author has confused taxonomic units and mapping units.

㉔ 8. Page 2-56 - The environmental statement indicates that fewer problems will be incurred in the Northern Rocky Mountains than on the Great Plains. We expect that less good top soil for revegetation is available in the northern Rocky Mountains than on the Great Plains.

㉕ 9. Some errors were noted in the data presented in Table 2.1.2.6-3, page 2-59, and Table 2.1.2.6-7, page 2-66. The streamflow data for Washington and Idaho was checked using U.S. Geological Survey Water-Data Report. A thorough check of data presented in the report needs to be made.

㉖ 10. Page 2-91 - The Soil Conservation Service has forage production estimates available that should answer the statement. "Estimates of average production are not known at this time."

㉗ 11. Page 2-93 - Photos 4 and 6 do not match with the corresponding descriptions and should be reviewed for their accuracy.

㉘ 12. Page 2-77 - "P. Randick" should be spelled "Randich." Also, the Geology and Ground Water Bulletin number of Kidder County, North Dakota, is 36 not 39.

㉙ 13. Page 2-139, paragraph 13 - The Prairie Pothole Region supplies waterfowl for hunters in North Dakota as well as other areas of the United States. Document should be changed accordingly.

㉚ 14. Page 2-163 - Recreation Resources (Cle Elum, Washington, to Plummer, Idaho) - Reference to a planned casino development in the Cresent Bar, Washington, is inaccurate. As yet, casino gambling in Washington is still illegal, at least at the time of this document.

㉛ 15. Page 3-65 - We suggest that the Soil Conservation Service's method of construction-revegetation of channels for North Dakota be considered. Basically the concept is vegetate immediately following construction and only a certain length of exposed area can be constructed until revegetation must begin.

㉜ 16. Page 3-70, fourth paragraph - Reference is made to five-day biological oxygen demand (BOD). We recommend the authors check their references since BOD usually refers to Biochemical Oxygen Demand.

㉝ 17. Page 3-80 - It appears some estimate of productivity of forest land that would be lost should be made. This could be approximated from Table 3.2.8-2 by forest types, assigning productivity rating per type.

㉞ 18. Page 5 (Chapter 5) - Under adverse impacts, there appears to be no consideration of the trespass damages by contractors and others to the area outside the corridor or easement area. There no doubt will be some.

㉟ 19. Page G-5 - Shrink-Swell Potential section on low and high has the language, "Following are examples of soil series. . . ." This sentence should be deleted as there are no "following examples" given.

We appreciate the opportunity to review the draft E.S. and will be happy to provide additional consultation on our comments if requested.

Sincerely,

Kenneth L Williams
Director

cc:
State Conservationists - Washington, Idaho, Montana, North Dakota, Minnesota
M. E. Strong, Director, WTSC
S. H. Fuchs, Head, Conservation Technology Staff, WTSC

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Route 5 Box 1162
Port Angeles, Wa. 98362
March 26, 1979

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① Bureau of Land Management
Northern Tier Project, Room 1250
Lloyd Building, 700 NE Multnomah
Portland, Ore. 97232

This addendum is to raise some additional questions and state some concerns not expressed on March 15th. Hopefully the briefness will not lose the meaning being conveyed.

On March 26th Northern Tier Pipeline Company went to the Washington State Energy Site Evaluation Council (EFSEC) with a proposed route change that would go from Port Williams in Clallam County to Partridge Point on Whidby Island, thence to Camano Island, through the Stanwood area and south. This alternative is described very briefly in the BLM draft, chapter 8. In fact, so briefly it neglects to mention the impacts on the fisheries of the area and has no oil spill trajectories for the Whidby-Camano Islands segment. This move is supposed to make it more palatable for the inbound refineries to hookup to the NTPC, yet there is no comprehensive analysis of the 3 berth, 1.2 million bpd throughput and the attendant storage needed. However on page 6-6 out of the blue "onshore storage facility with the full complement of 35 tanks", is this an error and on whose part or is there more to the project than is being presented?

Also on March 26th, Bill Sage, a NTPC coordinator announced on the local radio station KONP a new alternate berthing area to be east of the present proposal and would encompass the present Coast Guard Base. If NTPC's continual changes weren't so serious it would be comical, its certainly ridiculous. What are the impacts to the Port Angeles community if the coast guard base is no longer on Ediz Hook, both from an economic and a safety standpoint? Will the Coast Guard leave the area for Oak Harbor and Westport? The BLM draft states the NTPC will mean the need for 2 more coast guard personnel at the hook. And what of the present naval and FAA equipment operations at the CG base? What will happen to the historic site at the end of the hook?

Port Angeles Harbor presently has a class A water quality rating. How is it possible to allow a project that would by your own draft statement change that rating to a class C?

Barge traffic and spills for a 3 berth project are not adequately addressed. What about decreased air quality due to barge and tug traffic?

The Strait of Juan de Fuca will be the entry link between the Pacific Ocean and the Trident Submarine Base at Bangor, Wa. What effect will the increased tanker traffic have on this activity?

In page 1-1, 1.1 Purpose, paragraph 1 lists the Northern Tier states as defined by the Alaska Natural Gas Transportation Act of 1976, this does not accurately reflect figure 1.1 on page 1-2. Table 1.2-3 on page 1-5 does not speak to the Montana oil potential or recent finds in the western U.S. and N. Dakota.

[illegible] electric [illegible] projections seem to be based on 375,000 bpd throughput. Projects should reflect the total project needs.
Page 1-11 submarine lines [illegible] periods would seem to dispute the need for a third submarine line even with a 1.2 million bpd throughput.

page 1-15 Fire protection
How many men will be on duty and trained for firefighting in case of fire at the tank farm? Does the Public Utility Water System have the available water sources to provide water for fire fighting? It's my understanding they do not from comments made at the January 15, 1979 PCD meeting. The Port Angeles fire dept. is not the fire protector of the Green Point area. Green Point is served by local fire district #3 with volunteerfiremen. Backup comes from another local fire district #2 also manned by volunteer firemen.

Page 45, map add. designates the hook as a stable slope. There is little mention of the Ediz Hook erosion problem and the costs to maintain it from breaching. News article enclosed. You will note that it will require continued maintenance on a regular schedule.

CONT.

map add. 126-131
No mention is made of special treating of the pipe in areas where soil conditions are highly corrosive to steel.

page 1-30 Communication linkup combines land lines and microwave. The design for this system is based on leased service. Is this standard operations procedure? Who bears the liability and responsibility in case of problems? What are the impacts of the microwave system? They have not been addressed at all.

page 1-58 para 3 Contingency plans
The port authority for Port Angeles harbor is the Coast Guard, the local Port of Port Angeles has no authority other than its own facilities.

page 1-58 #25 Pray tell just what effect grants and loans for energy impacted areas would accomplish if there is no energy available? Suggest NTPC supply the needed energy through negotiated agreements from other areas, such as their wheeling concept. Then local area and state would be more able to supply existing business and industry when the 1983 power crunch comes.

page 1-58 #27 How will NTPC abide by this agreement for ballast if a VLCC requires up to 33% before leaving the harbor? Purging cargo tanks 10-20 miles from the harbor is still within the Strait of Juan de Fuca and residential areas, numerous tourist sites and Vancouver Island. How will the Port of Port Angeles, the operator of the dock facility or NTPC enforce such a requirement? The Coast Guard is the only authority with that power.

#28 The downtown Port Angeles area has had an air particulate pollution problem. Local industry and the city have been paving and using other means to overcome this problem, all without the help or assistance of NTPC. News article enclosed. Northern Tier has promised much but the hard fact of reality is they have provided little except fast talk and changing proposals.

page 2-8 Why weren't more noise readings done over a longer period of time to get a truer measure of the noise levels? More locations would also have been more graphic and have greater potential for substantiation.

page 2-15 wind generated waves Harbor is protected from such "except from the northeast" Isn't the direction the northeast?

page 2-28 other uses That is the skimpiest description of the Coast Guard facility and related uses on the base. Isn't there some naval instrument equipment operating on the base?

page 2-33 Why not use the Puget Sound Pilots station or VTS Coast Guard figures for vessel traffic rather than ASCO? Why isn't there a table showing the commercial fishing and recreational boat ownership for the Olympic Peninsula?

page 2-94 para 3 "The number of miles to be traversed by the proposed pipeline through wetland types is not known at this time." Is this a definitive statement? Certainly not informative.
78
page 2-column 2 What impacts will the NTPC have on this area that is of prime importance to the nation as a whole?

2-119 & 120 "Almost all of the forest land crossed by the corridor in the Puget Sound region is considered commercially productive". What is the NTPC impact on this region? What is the economic value and will it be reduced because of the NTPC?

table 2.1.2.15-3 Why aren't there any county or local police listed for Montana? Are the state police responsible for all the law enforcement in the state?

page 2-155, 2.2.1.13 Transportation and utility networks
Speaks of inland water transport opportunities without the NTPC project. Page 6-1 tanker unloading berths, speaks to commitment of the harbor to NTPC deterring additional development over the lifetime of the project. What is the negative and positive economic value impact on the port and community of such restrictions?

section 2.2 does not even acknowledge the Coast Guard base and its continuing and possibly expanded functions.

pages 3-44 & 45 I question your estimated peak traffic counts of project related traffic. If the project is on Ediz Hook what happens to the 800 of the project related 1020 in the downtown area? Your assessment of traffic impacts on county, city and state roads is clearly understated.

pages 3-6 & 7 How will the Coast Guard effectively enforce rules and regulations if it is no longer in the area?

page 5-3 para 3 If "the project cannot be determined with an acceptable degree of reliability" because of geologic event ... how is it possible to determine what 9 months of pile driving will do to a "high quality gravel" pile (meaning Ediz Hook)? resource for above page CL 118 Coastal Zone Atlas, Wn. Dept. of Ecology

page 2-32 para 2, also table 2.1.1.13-3 page 2-33 and map add. III-5
"Piers" might better be described as berths. There certainly are not 30 projections into the harbor for docking, but rather far fewer projections able to moor vessels of varying kinds. Also map addendum does not designate all "pier" areas in area, i.e. Port of Port Angeles Docks, M & R dock nor Port Angeles boat haven.

page 2-37 The numbers of ferry passengers carried to and from Victoria, B.C. by the ferry Coho should be listed. Especially peaks and lows, not just averages.

page 2-42 table 2.1.1.15-8 Why were intraharbor movements excluded from table? Why were 1977 figures not used? Were commercial fishing vessels entering the harbor included in the table? If not, why? Why was data adjusted relative to foreign oil imports?

page 2-137 The mill terminal for the Port Angeles harbor is long gone! However, there are four harbor proposals presently on the drawing boards and in final stages preparatory to building, which will definitely increase the economic base of the area. News articles enclosed.

page 6-1 A 20 plus year commitment of the harbor to the NTPC project with both immediate and long term restrictions on industrial and recreational uses would be an economic strangulation on the community. Have these losses been calculated? What are they?

page 6-2 tanker berths para 2 Last sentence leads one to believe the project would be a short term sacrifice of less than normal concern and little impact. What is the basis for such a statement? A life based on local natural resources involving production of products from federal and private timber sources; a tourist industry relative to the harbor, Olympic National Park and Victoria, B.C.; a shipping industry that provides an [illegible] help to a balance of trade debit rather than deficit; a commercial fishing industry base; what are the economic values of these?

page 5-7, 5.1.13 para 1 & 2 Where will tanker queuing take place, in the harbor or elsewhere? How large is the nonanchorage area to be over the submarine lines (3)? Why has it not been designated or shown in graphic form? Exactly what impact will increased tanker traffic and queueing have on restricting present incoming and outgoing vessel traffic-i.e. logbooms, barges, logships, ferry Coho, commercial fishing boats and recreation boats (both motor and sail)? What will the impact be on the inner harbor movement of lografts and chip barges from one place to another? What impact would a restricted anchorage designation have on present vessel anchorage? How would a VLCC 325,000 DWT tanker at anchor in the harbor affect or restrict existing harbor traffic usage and vessel movement? How many tankers of what size could be anchored in the harbor and still have the present normal vessel movement? Where outside of the harbor would waiting tankers anchor? What specifically would be the "occasional inconvenience to other commercial vessel traffic"? Is this local commercial traffic or is it commercial traffic going inbound or out to sea? Or both?

page 5-12 Isn't it interesting that we will lose property tax revenues on abandonments, yet therein nowhere in this document sufficient factual material to determine with any accuracy whether there will be enough incoming revenue to offset the costs of [illegible] local government units will be responsible for providing?

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CONT

Air quality impacts have not been stated as they are understandable by the layman concerned about his tree farm, orchard or garden and the impacts thereto.

At the NTPC briefing held in Sequim on November 21, 1978, John Laque of EPT when questioned stated Sequim had had a high ozone reading at the Sequim Fire Hall in 1973. What caused this high reading and what effect will the NTPC project have on such existing factors?

page
2-38 What will be the impact on the Puget Sound area of sulphur dioxide and ozone pollutants coming from the Port Angeles area?
2-152 2.2.1.2 air quality para 3 Little change in sulphur and oxides is anticipated without NTPC. How would the NTPC affect this statement? Especially when ours 3 ranks to limiting of any future industrial growth because of the class I designation of Olympic National Park?
page
2-158 What will be the impact on existing industries ability to expand relative to air quality standards if NTPC is in the harbor? What is the air quality impact with a 3 berth facility handling up to three 327,000 DWT tankers concurrently in the harbor?

3.1.2 Since NEPA and SEPA require impacts of a total project to be addressed, what are the maximum increases of daily and average annual sulphur dioxide concentrations, nitrogen oxides and ozone levels with a 3 berth, 25 tank storage capacity project?

page 3-3 Why the use of old data from Coast Guard base that is not relevant to higher elevation areas back from the shoreline with different terrain, temperature and wind patterns? What will the effect be of the added sulphur dioxide and hydrocarbons on the area between the proposed port and the tank farm? What are the sulphur and ozone impacts on the Morse Creek and Elwha River draws (valleys and canyons)? Why wasn't northeasterly wind pattern air monitoring or modeling done for the harbor and tank farm? In the past few years wind patterns in our area have been changing.

page 5-2 Why have no significant mitigating measures been identified for air quality?

page 5-9 What is the specific "potential regional power supply shortage" with the NTPC in Washington State? What is the actual and real impact on existing industry power requirements? If a shortage does occur, will the local industries be required to shut down while NTPC continues to operate? What impact would that situation have on the local economy? Would new industries be restricted from locating in the area or state because of the power shortages? What would the NTPC project impact power demands be on the region's ability to attract new industry to Washington and surrounding states?

map add. page 19 NTPC has been rather blase' about the electrical power questions, talking about wheeling of power which does not seem feasible easily accomplished from this map. They have also said they could go to diesel pumps. Has an air quality assessment been done on such a possibility? How would that effect the cost vs benefit of the proposal?

The Missoulian Daily carried a small item on March 20, 1979 about the appointment of an energy manager for the BLM office in Billings, Mont. Copy enclosed. Strongly question such an action at this time. Private land owners could feel coerced.

The NTPC proposal has been totally negligent in adequately addressing the impacts and consequences of its project on our Canadian neighbors across the Strait of Juan de Fuca. Oil know no invisible boundary, national or otherwise.

Mr. Dan Betts of the U.S. Energy office at a symposium in Seattle on March 23, 1979 stated the BLM draft ES on Crude Oil Transportation System would be the only draft document issued on the several proposals so far submitted.

Changes by Northern Tier Pipeline Company of locations on March 26 and just before the deadline for submittal of comments relative to the project certainly give NTPC a decided advantage by not allowing sufficient time for those areas affected to peruse the large document and make their concerns known to BLM. This would appear to be a violation of the NEPA process. More time should be allowed for those affected to make comment, since this is their only opportunity.

Respectfully submitted,

Rosemary Cockrill

Rosemary Cockrill

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BOARD OF COUNTY COMMISSIONERS

Clallam County
State of Washington
PORT ANGELES 98362
Phone 452-7102

Making copies

126

April 2, 1979

Manager, Bureau of Land Management
Oregon State Office
729 N.E. Oregon Street
Portland, Oregon 97208

RE: CLALLAM COUNTY RESPONSE TO DRAFT E.I.S. -- NORTHERN TIER PIPELINE COMPANY'S CRUDE OIL TRANSSHIPMENT FACILITY

Dear Sir,

The Northern Tier project would be one of the largest oil port facilities ever proposed. The impacts and ramifications of such a project would be immense and far reaching. Considering the magnitude of the proposal, the D.E.I.S. that B.L.M. has published is totally inadequate. An in depth study of the document has revealed many erroneous assumptions, conclusions, and a general lack of credibility regarding the nature and scope of the impacts relating to social, economic and ecological consequences of the oil port proposal.

Furthermore, the County has recently been informed that Northern Tier plans to utilize an alternative route across Puget Sound, instead of the previously proposed route around the sound. Consequently, the B.L.M. Draft E.I.S. has become outdated because the alternative section dealing with the underwater Puget Sound route was grossly inadequate in analysis of the impacts. The County has now learned that B.L.M. does not plan to recirculate a new draft statement as a result of that change. The County must protest this decision as an obvious violation of the intent and purpose of N.E.P.A. Even before this change, the County had requested that B.L.M. redraft and recirculate the draft because of the gross inadequacy in impact analysis; see County Commissioner Ron Richards' speech, March 15, 1979, B.L.M. Hearing. With this new substantial change in pipeline route, the County must reiterate its concern that the draft be amended and recirculated. In support of this position, we would refer you to S.E.P.A. guidelines W.A.C. 197.10.495 where it states that a S.E.P.A. Draft E.I.S. shall be amended and recirculated when a substantial change has been made to the proposal. While B.L.M. is not operating under the dictates of S.E.P.A., surely the spirit and intent of N.E.P.A. would also require further analysis and recirculation under such special circumstances.

The B.L.M. product the County has reviewed represents a token effort to comply with federal regulations and any decision to not amend and recirculate the Draft E.I.S. must be considered an affront to the spirit and intent of the National Environmental Policy Act. The inattention B.L.M. has given to the impacts could ultimately result in the project having an adverse effect on the health and welfare of the American public. Clallam County hereby submits the attached materials and this cover letter as its official critical comments identifying the major deficiencies of the B.L.M. Draft Environmental Impact Statement regarding the Crude Oil Transportation System Proposal.

BOARD OF CLALLAM COUNTY COMMISSIONERS

Dick Lotzgesell

Ronald N. Richards
Ronald N. Richards

Harry L. Lydiard
Harry L. Lydiard

BCCC:lw

attachments

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CONT

EVALUATION
OF THE

DRAFT
ENVIRONMENTAL STATEMENT

CRUDE OIL TRANSPORTATION SYSTEM:
PORT ANGELES, WASHINGTON, TO CLEARBROOK, MINNESOTA
(AS PROPOSED BY NORTHERN TIER PIPELINE COMPANY)

PREPARED BY:

CITY OF PORT ANGELES / CLALLAM COUNTY

TASK FORCE

SUBMITTED TO

CITY COUNCIL
PORT ANGELES, WASHINGTON

BOARD OF COUNTY COMMISSIONERS
CLALLAM COUNTY, WASHINGTON

TRANSMITTED TO:

U.S. BUREAU OF LAND MANAGEMENT

APRIL 2, 1979

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City of Port Angeles
Clallam County
TASK FORCE

Board of Clallam County Commissioners
Courthouse
Port Angeles, Washington

City Council
City Hall
Port Angeles, Washington

April 2, 1979

Dear Board and Council:

The attached report is submitted for your consideration and the consideration of the U.S. Bureau of Land Management in its preparation of the Final Environmental Statement on the Northern Tier Pipeline Company project application. The material is a compilation of comments and data generated by Task Force members in the evaluation of the Federal Draft Statement. These comments reflect members' personal knowledge, technical expertise and individual research. Numerous references and authorities were utilized, including local, state and federal government agencies.

This report is a compendium of member input. Comments are included verbatim unless more than one comment on the same issue warranted a summary statement or unless it became necessary to render a comment more concise and/or more clear. Utmost care was given, however, to preserving the intent of the original comment. Editorial remarks were generally excluded in the attempt to maintain a factually-based review. Throughout the course of the evaluation process, it has been the principal goal of the Task Force to accomplish an objective and factual review.

Topic committee members were the primary contributors in each subject area. However, in many instances, members contributed comments on several subject areas. Additionally, several topical committees, by the very nature of their respective subject responsibilities, overlapped in scope of review. Examples of these were the Oil Spill, Fisheries and Harbor Management Committees; Law Enforcement, Fire Protection and Emergency Services Committees. Although attempts were made to minimize redundance, some overlap has inevitably occurred. Hopefully, whatever overlap is evidenced in this report will serve to underscore the multifarious impacts of this kind of project proposal.

As you know, the City-County Task Force is comprised of over 100 citizen-volunteers on 24 committees. The attached report is the product of a remarkable citizen effort to participate in a public review process. Task Force members had scarcely a month to review a copious, and rather tedious document, produced by a team of 45-professionals plus a number of professional service contractors over a period of 11-months and costing $3½ million. Local government should be indeed proud and extend profound appreciation to these citizens who have made such a significant and wholly voluntary contribution to this effort. Their participation has represented numerous long hours reviewing the document, pursuing source materials, confirming references, participating in regular committee meetings, drafting comments, etc. In summary, they gave their best effort and it is laudable.

The National Environmental Policy Act (NEPA) has been interpreted in Court as requiring a "full disclosure" Statement. A Federal Environmental Statement is not only expected but required to be a full and thorough assessment of impacts consequent to a project application. A Draft Environmental Statement (DES) is circulated for public review and comment in order that the public have every opportunity to assist and to assure that the process is serving the public interest.

CONT

When, in the course of review and comment, it is found that the DES is not a full and thorough disclosure then it may be assumed that the public interest is not being served. If member comments are a measure of corporate opinion, it was the prevailing opinion of Task Force members that this DES lacked sufficient data and detail. Specific references to these shortcomings are cited herein. Hopefully these comments will be of value in the preparation of the Final ES.

In addition to Task Force member comments, this report contains a critical evaluation of the Draft Environmental Statement prepared by Reed Hansen of The Urban Institute, Washington D.C. (See Appendix A) His comments are detailed and specific and reflect the expertise of the Urban Institute in performing social research and economic analysis. Mr. Hansen's evaluation is to be considered a substantive part of the Task Force comments and requires the same thorough reading and response that the BLM should give the body of this report.

It is my understanding that these comments and the appendix material will be transmitted to the Bureau of Land Management in the company of the statements of the City and County. If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Mike Doherty, Coordinator
Oil Port Task Force

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Clallam County
City of Port Angeles

OIL PORT TASK FORCE
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Brown, Ed
Corbett, Margaret
Crary, G.C.
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*Unger, Gene
Wagner, Ernie

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*Lynne, Dennis

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Alternatives

Rudolph, Shannon
*Turner, Norma

Archaeological/Historical

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Hopple, Jim
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Perry, Gwen
Watkins, Barbara

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*Carr, Paul

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Clark, Barbara
Dempsey, Kathy
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Larrivee, Mike
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*Orton, Robert
Porlier, Victor
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*Frizzell, Don
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Moss, Sheila
Scharf, Janet
Simpson, Steve
Tharaldsen, Karen

Transportation

*Leach, Bob
Owen, Bob
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Water Quality

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Kitz, Mike

Wild Life and Plant Life

Brown, Henry
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Crawford, Paul
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Feiro, Art
Greubel, Marie
Kenny, Cathy
Moorhead, Bruce
Oliver, Susan
Rennie, Clay
Standish, Johanna
Tisch, Ed
Wilson, Don

Policy Committee

*Dorothy, Duncan, Chairman
Port Angeles City Council

Harry Lydiard, Vicechairman
Clallam County Board of Commissioners

Carol Boardman
Port Angeles City Council

Dick Lotzgesell
Clallam County Board of Commissioners

Staff

Mike Doherty, Coordinator
Judy Sheridan, Admin. Asst.

Advisors

Ken Whorton, City Manager
Craig Miller, City Attorney
Grant Meiner, Pros. Attorney

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## AIR QUALITY

① Summary: Page 21
Omission: Consider regular volumes of air pollution resulting from slash burning in forest areas of Clallam County.

② Ommission: Air quality impacts are regional in nature. The combination of present pollution levels (from local industry, vehicles, slash burning, etc.) and the contribution of a potential oilport (plus probable secondary petroleum - based industry - See the "Land Use" section of this report) will create a significant pollution problem. The California Air Resource Board projected severe impacts on the entire Los Angeles Air Basin from the Sohio project. It appears that the equivalent land area in Washington would extend from Cape Flattery to Bellingham, Bellevue and Tacoma. It should be noted that the Sohio project was approximately one-half the size of the Northern Tier project. The BLM should provide a thorough analysis of regional air quality impacts .

③ Summary: Page 21
Deficiency: "The Clean Air Act standards for PSD for sulfur dioxide would probably be exceeded about two days per year" is a statement which sets the tone for the entire DES. "About two days" is a dimension which is useless to someone reviewing the report. If it means two or more days then this is a violation of CAAA'77, if less than two, it is not a violation.

④ Comment: The 1978 state legislative support for the oil port of Port Angeles reflects the belief of the Seattle-Tacoma residents that the port will eliminate tanker traffic to inner Puget Sound and through the San Juan Islands. All the impacts on Clallam County are stated for an oil port which will not reduce tanker traffic to the refineries and may actually increase petroleum traffic if distillate or Bunker fuel is barged to Port Angeles. The air quality and oil spill impacts on Clallam County should be modeled and reported in the DES for a 1,200,000 bpd through put. Unless a 1,200,000 bpd port can be legally located in Clallam County the deceptive tactics now being used to gain undeserved support for oil transshipment should be stopped.

⑤ Summary: Page 21
Comment: The air quality deterioration cited would be a violation of the Clean Air Act as Amended in August 1977, for sulfur dioxide. On pages 3-4 and 3-5 under "operation Phase" it is claimed that such violations will not occur more than once each five years. It is believed that the statement on Page 21 of the Summary is the more nearly correct. Information on which it was based should be placed in proper section of BLM Environmental Statement.

⑥ Sec. 3.1.1; Page 3-1
Omission: "The proposed project will have no significant effect on climate" is a rash statement unsupported anywhere in the DES. Effects on climate by major pollution sources such as an oil port occur some distance down wind. For this instance the area affected is Sequim, Kitsap Peninsula and the Puget Sound Non-attainment area. The Sequim climate is distinctive enough that much of the area has been developed because of the low precipitation rate and increased sunshine. See "Washington Climate EM 3708 Dec. 1972, Cooperative Extension Service, Washington State University". Numerous references show much larger areas than the Sequim Prairie have had increased rain fall due to upwind changes in particular, heat or other pollutants. See Weather and Climate Modification, National Research Council, National Academy of Science, 1973 or "change in the Weather" by Fitzhugh Green.

⑦ Sec. 1.2.2.1; Page 1.2-2
Omission: The EPA challenged data for the 3rd and Chestnut $SO_2$ monitor for January thru March, 1977. The monitor was then out of service until December, 1977. Reading from January 1978 thru June 1978 are considered valid readings. After exceeding the Federal Primary standard in June, 1978, monitoring was stopped until December. Report #EPA 910/9/78-049A Dec., 1978 "Washington Environmental Quality Profile 1978", page 5, Figure 2 shows the Health Stands for $SO_2$ were exceeded an average of 6 days per year for the years 1974, 1975 and 1976. The 3rd and Chestnut monitor location is in a fully developed residential area and would measure $SO_2$ levels seen by a significant portion of the Port Angeles population. Meteorological data from the town of Port Angeles, not from Ediz Hook, should be used in $SO_2$ pollutant modeling.

⑧ Sec. 3.1.2; Page 3-7
Omission: There have been several readings on the zone monitor in Sequim of 0.07 ppm. (70 ppb.) and has approached the 80 ppb. standard. The Reid Vapor Pressure selected for this study makes discussion of HC and $O_3$ useless. Once the correct RVP is used additional modeling should be done for Sequim and other downwind locations.

⑨ Page 1-35
Omission: Speaks to storage to be added at Clearbrook, Minnesota to be built by someone else other than Northern Tier. The storage capacity spoken to is for one million barrels. Page 3-57 states the additonal storage to be built at Clearbrook would result in an increase of annual emissions of hydrocarbons from ONSHORE STORAGE TANKS of 85 tons per year. The ONSHORE STORAGE for Green Point with 25 tanks would be 13.6 million barrels with hydrocarbon yearly emissions in amount of 85 tons x 13.6 million assuming formula given on page 3-57 is correct.

⑩ Sec. 2.1.1.2; Page 2.4
Omission: Wood is a "dirty burner" and wood burning is widespread in Port Angeles. This is a major baseline source and should not be ignored.

⑪ Sec. 3.1.2; Page 3.2
Deficiency: Maximum length of time for ACUTE DUST PROBLEMS and effects on outdoor living habits of current Green Point residents. How will residents be compensated for dust problem damage to yards and/or paint damage and cleanup problems. Impacts for all const. phases.

⑫ Sec. 3.1.2; Page 3.2
Deficiency: Port Angeles has been notified by the Washington State Department of Ecology that it is not meeting clean air standards. The BLM-DES does not speak to the problem of how to transport men, material, and eqipment to the marine terminal site without creating a significant deterioration of the city's air quality, especially downtown.

⑬ Sec. 3.1.2; Page 3.2
Deficiency: No baseline data is presented on the number of people in the area with respiratory problems that would make them unusually sensitive to oil port and tanks form pollutants. There are many residents of the Sequim area who moved to clean air for relief from respiratory ailments or allergies. Impact

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⑬ data on the health of humans is lacking. Some state and federal air quality regulations were written recognizing that even when there might be adverse impacts on the health of some humans. The health basis for the air laws or standards should be covered in the FEIS.

⑭ Sec. 3.1.2; Page 3.2
Omission: State and local and federal air quality standards are ignored during construction. Fugitive dust levels are ignored. For traffic alone a 5 mile pipeline section and pipeline construction and storage facility construction SAI estimated more than 12 tons a day during peak periods. How can this be ignored?

Sec. 3.1.2; Page 3.2
Omission: Discussions at public hearings indicate NTPC did not consider the needed watering trucks in their calculations. This is a serious omission considering the amount of watering need for soil compaction to 95% at the tank farm and pipeline and need to prevent fugative particulate in the summer construction.

⑭ Sec. 3.1.2; Page 3.3
Deficiency: Mathematical modeling studies have not been undertaken to obtain quantitative estimates of air quality impacts during construction. Significantly, the provisions of the CAAA of 1977 regarding PSD exempt such transient construction activities from consideration for allowable air quality increments. It does not exempt them to violate ambient standards. The exemption applies only if the construction emissions would exceed PSD increments but be within standards. There is a TSP non-attainment in Port Angeles, a serious $SO_2$ problem (probably at non-attainment levels), and areas that may exceed dustfall standards. The massive $NO_x$ emissions during construction could well cause $NO_x$ violations. It is absolutely essential that construction emissions be modeled. Construction odor and noise laws and violate standards protecting degradation of Class A water.

⑮ Sec. 3.1.2; Page 3.3
Deficiency: Page D-9, Appendix D, Engineering, "West Coast Deepwater Port Facilities Study", June 1973, by U.S. Army Corps of Engineers states that: "(1) Fixed berth. Waves higher than six feet and winds with a velocity of 24 knots and over will suspend berthing and deberting operations, whereas currents not parallel to the axis of the berth will increase the difficulty of these maneuvers. Wind speeds in excess of 37 knots will suspend unloading operations because of the forces on the unloading equipment." Also, a problem peculiar to Port Angeles harbor is that during storms break up of log booms may make it impossible for tugs to maneuver tankers into or away from piers. One reason for the tanks form is to permit pumping to continue when tanker arrival or unloading is interrupted. When supplies of crude are reduced in the tank form and several tankers are awaiting unloading because of labor, operational or weather conditions, the true worst case emission situation will develop. All piers will be used as rapidly as possible until the tankers are unloaded, with preference probably given to the larger tankers. More than once a year, continuous use of both piers for over 100 hours could be expected. Therefore, the higher wind speeds should be excluded from tanker stack emission dispersion models, since unloading would not be performed under those adverse conditions. Modeling should be performed for post-storm conditions when a waiting line of tankers will unload at maximum rates in what is usually calm wind conditions. Allowance for suspension of berthing should be clarified in the FEIS.

⑯ Sec. 3.1.2; Page 3.3
Comment: The projected port call frequencies are probably incorrect. As pointed out in the Upper Midwest Crude Oil Supplies Problems and Alternatives, the total Aslakan through put is now estimated at 1.2 mbpd. The west coast can use 700,000 bpd and the Sohio project can use 500,000 bpd. There will be only 100,000 - 400,000 bpd left for NTPC or 25% of the 1.2 mbpd, not 50%. This table also does not take into account the segregated ballast per ship. For example the 300,000 dwt class have only 11% segregated ballast. This would account for 108 tons more of HC emissions for the lowest through put of 709,000 bpd.

⑰ Sec. 3.1.2; Page 3.4
Deficiency: This complex mechanism omits several well established reactions of $SO_2$. In view of the fact that the annual exhaust emissions from tank stacks are 2,539 tons per year of $SO_2$ and 461 tons per year of $NO_2$, $SO_2$ is a pollutant of consideration importance. It will react with every atomic and radical species in the photochemical mechanism and with $O_3$ as well. Why is the photodissociation of $O_3$ omitted? It has a much higher extinction coefficient than $H_2O_2$ (reaction 21) and absorbs light at longer wave lengths.

⑱ Sec. 3.1.2; Page 3.4
Mitigation: Use of very low sulfur content fuel by tankers in port would, if accomplished, be a successful mitigation for sulfur dioxide. A permit for the port could be assessed with the provision that only 0.5% sulfur content fuel be used in port. Unless the enforcement agencies and procedures are more successful than historically proven, more and stronger mitigations are needed. Two measures submitted for discussion are (1) Have a bonnet over the stacks of the tankers and process the flue gases through scrubbers, bag houses, precipitators, catalytic, converters or whatever is necosary to remove $So_2$ and $NO_x$ and TSP. (2) Have flue gas monitors on booms to insert into the tanker stacks to actually measure pollutants.

Sec. 3.1.2; Page 3.5
Omission: Annual geometric mean concentrations measured at the police station monitor (moved in 1976 to city light building) were slightly above the WDOE standard of 60 mg/m$^3$ each year 1971-1976. Points to be made that 1970 and 1977 also had violation. Violations from 10-28% over the standard should not be considered slight. 60 mg/m$^3$ is not only a WDOE standard but also a federal secondary standard. Although fugitive sources are difficult to model they cannot be ignored.

⑲ Sec. 3.1.2; Page 3.6
Omission: $NO_2$/NO ration assumption is not given; the effect on changing $NO_2$/NO ratio due to new vehicle emission standards is not evaluated; $NO_2$ emissions from construction is not evaluated in terms of existing standards (not exempt); $NO_x$ is not evaluated for visibility reduction.

⑳ Sec 3.1.2; Page 3.6
Deficiency: The rationale for worst case for tanker hydrocarbon emissions overlooks several factors: The assumption that ballast emissions will be the worst case hydrocarbon emissions is incorrect. The worst case will be in the event of an oil spill where 15% of the oil enters the air within the first two hours. The second worse case will be purging. It is stated that purging will not be done in port except in an emergency,

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⑳ a situation which may be under control of the ship's captain rather than Northern Tier. Further, it is indicated that purging might occur once the tanker is outside the harbor.

Sec. 3.1.2; Page 3.6
Deficiency (continued): This is just the right distance from Port Angeles and Sequim for maximum air quality impact. The worst case emission schedule should be computed for an oil spill of one tanker compartment (60,000 barrels) and for purging of the largest size tanker in port and 10 miles from port. The third worse case for ozone, photochemical exidant or smog formation would be for two tankers to take on ballast at the same time, an event which is likely to happen more than once per year. EPA - 450/2-76-016 Aug. 1976, Page 18 of "The Health Implications of Photochemical Exidant Air Pollution to Your Community" reports that the most effective means of reducing levels of oxidants is through control of hydrocarbon emissions. Since there is reportedly 2772 tons of nitrogen oxides per year emitted from existing Port Angeles sources, the third worse case model of two ballasting ships providing the maximum hydrocarbon emission would seem to apply. Specifically, if two large tankers took on ballast from 6:00 a.m. to 9:00 a.m., under temperature inversion of approximately 1,000 feet with full consideration of the dispersion blocking by the nearby mountains, the tiny Port Angeles, Sequim air shed would be in violation of existing or planned air quality standards. During the 6:00 a.m. to 9:00 a.m. time interval, it is estimated with a Reid Vapor Pressure of 8.0 that there would be over 27,000 pounds of hydrocarbon emissions.

㉑ Sec. 3.1.2; Page 3-7
Comment: No mention is made of ship stack blowing. No mention is made of the steam emissions. These could effectively block the view of Victoria from downtown Port Angeles (the stacks of each ship will be near 100,000 acfm). WAC 18-04-040(1) & (5) is not even mentioned let alone evaluated. (5) emissions of air contaminants or water vapor detrimental to persons or property. No person shall cause or permit the emission of any air contaminant or water vapor from any source, including any air contaminant. No person shall cause or permit the emission of any air contaminant or water vapor from any source, including any air contaminant whose emission is not otherwise prohibited by this regulation, if the air contaminant or water vapor causes detriment to the health, safety, or welfare of any person, or causes damage to property or business. The tanker emissions, water vapor, could be detrimental to downtown tourist business and reduce view property value at some locations. It would appear that during unloading a ship could also be in violation of section (1)(a) and (b) 40% opacity and grain loading of .2 gr. SCFD or 20% opacity and a grainloading of .1 gr./SCFD. with emissions of 42.4 lb/HC and 100,900 ACFM 300°F there appears to be a violation.

Page 3-7
Comment: It is assumed in the DES that $O_3$ levels will decrease. "Ozone & light hydrocarbon measurements in the Phoenix Arizona" (Westberg, Robinson, Zimmerman 67 annual area meeting, state it can also be shown on the basis of laboratory data that the amount of $O_3$ generated by $NO_2$ and the hydrocarbons is not only a function of the concentration of these reactive components but also in the ration of their concentrations. It is on this basis that Chas and others have argued that automibile exhaust controls that lowered the emitted hydrocarbons were much less effective in reducing the Los Angeles photochemical smog problem because hydrocarbon control has gained at the price of an increase in no emissions. The resultant no-hydrocarbon ratio is then larger than the pre-control value and is suspected, on the basis of laboratory studies, to be a situation capable of supporting efficient atmospheric $O_3$ product catalytic converters increases the sulfuric acid mist. Since changes in auto emissions is mentioned it is an omission not to mentioned the two above mentioned detrimental effects.

㉒ Sec. 3.1.2; Page 3.7
Mitigation: The selection of a Reid Vapor Pressure of 4.0 psia nigates all computations for hydrocarbon emissions, both tanker and tank farm. There is ample documentation showing 8 to 12 psia as typical "Reid Vapor Pressures". An oil port receiving oil from all over the world would be expected to receive oil with RVP of 12 or more, and certainly with a True Vapor Pressure of more than 11.1 psia. Therefore, in accordance with standards for new source emissions the tank farm would require a vapor recovery system as a mitigating action. A weighted average computation for the RVP conceals the worst case for hydrocarbon emissions. For example, the formula on Page 44 of the Technical Document for this DES has the term $\left(\frac{P}{14.7-P}\right)^{0.7}$ as a multiplier in computation of storage tank standing losses. P represents the true vapor pressure, which is essentially equal to the Reid Vapor Pressure at the temperature expected for North. Slope Crude. With P=4 the term becomes 9.50. With P=12, (not an unlikely worst case reading), the term is 2.82. This means the estimates of hydrocarbon emissions should be over 500% higher than those used in the DES. Reid Vapor Pressure references as high as 12 psia were found documents available to the Clallam County Task group.

㉓ Sec. 3.1.2; Page 3-7
Omission: Since the HC emissions have been underestimated by a factor of 5 the statement that emissions from the project would be substantially smaller than those from existing sources is questiond. The statement that effect on visibility would be evident only to some one in the park looking toward Port Angeles is incorrect. Major impacts on visibility would be looking from Sequim-Dungeness, San Juan Islands, or Victoria, B.C. through the haze toward the snow covered peaks in the Olympic National Parks.

Page 102
Deficiency: It is claimed that adverse weather is incorporated into the model as a random variable. No definition of adverse weather is provided or any hint given as to what extent the random variable changed the model.

Sec. 3.1.2; Page 3.7

Omission: At the Sequim location there is $O_3$ data for 4-78 -- 7-78 showing maximum values of .07. A similar trend is indicated in Port Angeles at a 2nd and Washington monitor, indicating levels at .04 in Feb, 1974. This corresponds well with the Sequim Data so we could expect summer concentrations at .07 - .08. Some argument has been presented as to the validity of the Sequim data because it is near HWY 101. The majority of Sequim is within two blockes of HWY 101. PSD guideline state for vehicle traffic 1,000 VPD. The sampler should be 20 meters from the road. For Cedar Street this criteria fits well and for traffic flow from 1,000 to 10,000 it should be from 20-250 meters away. The sampler is within this range. This data should not be ignored. This data is representative of the general area (Sequim) concerned.

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Sec. 3.1.2; page 3-7
Deficiency: Page 16 of this DES's technical document claims that there is no hydrogen sulfide in crude oil below 200° F. Perhaps this is a reference to one particular sampel of crude There may be thousands of ppm of $H_2S$ to crude oil in the DES all references to odors should be restated. Further, since fatalities can result from as little as 100 ppm of $H_2S$ the hazards hould be subject of complete coverage for fatalities as well as odors.

24 Comment: The impact of discharging oil contaminated waste water at the tank farm is not openly discussed. There is a vague statement on air quality to the effect that there will be large emissions of hydrocarbons if substantial amounts of waste water is processed. This is not a full disclosure of information in layman's terms. By use of information available in other BLM reports it was estimated that up to 2,790,000 gal/day of waste water will be discharged to Siebert Creek from the bank farm. Since this is water from oil tanks it should not be permitted to reach Siebert Creek or the Strait of Juan de Fuca. A possible solution is to pump the water to a separate tank at Green Point and then return it by separate pipeline to the port for use as ballast water.

Sec. 3.1.2; Page 3.7
Question: CBI studies. Four points should be made. 1) these CBI studies were 1978 so have had insufficient time for evaluation and field application, 2) CBI makes storage tanks and socould produce biased results, 3) The CBI/Sohio studies are on a mock up rather than on field tanks (per evaluation of meths for measuring and controlling H5 emissions from petroleum storage tanks; EPA and 4) SAI reported studies (in their report for the BLM NTPC EIS) showing API underestimating emissions 38% of the time. Quotes from the above EPA evaluation: "Advances in roof design have been directed at improved safety, durability, ease of construction and low cost. No experimental data were found to indicate that any particular design (whether new or old) was effective at controlling hydrocarbon emissions than any other design." In discussing the variety of newer flexible seals: "however, no experimental data were found indicating any particular seal was superior to any other in controlling emissions. Claims to seal effectiveness are based on appearance and apparent closeness of fit between the seal and tank wall." and as for best technology: "vapor recovery offers the potential for positive control of hydrocarbon emissions from storage tanks".

25 Sec. 3.1.2; Page 3.7
Deficiency: On the average about one pound of HC will be emitted for every 1000 gallons of Ballast water. The EPA oil disposition study (EPA: 910/9-77-044) uses a fixed roof tank emission calculation. This takes RVP & temperature into account. So is more reasonable than ERT's figures $F_{c0} = \frac{2\text{-}25PV}{10{,}000} K_t$ ($K_t$ = 23 turnover rate, P=true vapor pressure, V= volume pumped into tank). For example if we use a more realistic vapor pressure of 4.1 RVP with the increased oil temperature which Alyeska says they will use "Summary Report - Air Quality for TransAlaska Pipeline Terminal" submitted to the Alaska Dept. of Environmental conservation) we increse emissions 147% for the phase II temp. emissions and 244% for phase three temperatures. ERT states 16,300 lb/ eve (in error their chart lables it $10^3$ gallons) for HC emissions for 300-327,000 dwt. This equates to 39,772 lb/event using a realistic RVP and taking into account that the oil temperature will rise. SAI states ballasting for this class will be 4.7 hours compared to 8.49 or 1.8 times the concentrations.

Sec. 21.17: Page 29.
Mitigation: Predicts relatively high $NO_x$HC , and CO pollutants for on-road vehicles. The possibility of railroad service being continued to offset air pollution should be examined. The railroad should carry freight with less air pollution per ton/mile than trucks. Since the railroad owner is a member of the Northern Tier Consortium the reduced air pollution would offset to some extent the increased pollution from the oilport. It is understood that over $2,000,000 in State or Federal funds is being sought to keep the railroad operating.

26 Sec. 3.1.3 Page 3-8
Question: It is stated that Washington State Noise Standards will be exceeded during the construction phase. There is not full and clear coverage of the noise to be expected during the operation phase. Page 3-10 states that the Washington Standard of 47dBA would be equalled at one location, without specifying location. Presumably the pumps would be the noisiest item at the tank farm but there are agitators on the tanks which are not mentioned as to noise level.

27 Page 8-106:
Question: "Tank design features would minimize hydrocarbon release." What is the tank design? Are floating roofs included in the design?

28 Page 8-106
Question: What level of "incremental" increase in hydrocarbons from tanker offloading? Please quantify "incremental increase".

29 Page 8-103
Ommission: A statement in the DES, regarding the Kitimat projects declares that the unloading facility will introduce major new hydrocarbons. No such qualifying statement is made regarding hydrocarbon level introduced to P.A. by NTPC under air quality summary, page 3-2.

30 Sec. 3.1.2-8 page 3-5
Question: What is the definition of "Strong" under column headed "inversion strength."? The column "Average Time" shows the longest period is 24 hours for the "Worst case". What condition would prevail in a "strong" inversion lasting 36 hours? 48 hours? 72 hours?
Did the weather data from Ediz Hook contain a complete report on inversions?
Why was only 5 years of weather data used? Were the 5 years consecutive? Which years?
To determine the true pollution figures, you need weather data from other locations. Weather data from Ediz Hook is only pertinent to the location of the instruments used. Water surrounding Ediz Hook on three sides contributes to a unique climate, vastly different than in the Port Angeles area.
Why has there been no mention made the possibility of the pollutants being air-borne to King County and other places? Why does it say in the summary on page 2, section 3, that the ozone level in the vicinity of Green Point might be increased by 10% while in the same section, page 7, it says that the ozone levels at Green Point will be raised by 20%?
According to EPA's Washington Environmental Quality Profile of 1978 only two counties, Clallam and Pierce, do not meet air quality standards for Sulfur Dioxide. Why was this not mentioned in the DES?

31 Page 3-6
Ommission: The serious ecological problems of acid rain and effect of hydrocarbons ommissions on human health have been ignored by the BLM. ACID RAINS: Acid rains and snows have well documented unfavorable effects on aquatic life in lakes and plant life in forests.
Chemical and Engineering News, page 29, Nov.22, 1976;
Environmental Science and Technology, 12 580; 1016 (1978)
Seattle Times, Mar. 8, 1979.

CONT 31 The potential decimation of fishlife in our lakes and streams and the retardation of forest growth will have a serious effect on our industrial economy, tourist business and quality of life on the Olympic Peninsula. Acid rains result from the oxidation in air of the pollutants, $SO_2$ and $NO_x$. The products are sulfuric and nitric acids. The air is cleansed of these corrosive compounds by rain and snow and fall to the ground as acid rain. Extensive studies of its deleterious effects have been reported. Some of the findings are:

1. Decline in fish population in Norway has been correlated with acidity of streams and lakes, and trout and salmon are seriously affected by pH's less than 5.5 Newly hatched fish are most vulnerable to acid. The pollutants originate in England, Europe.
2. In Sweden about 10,000 lakes have been acidified to pH's less than 6. 5,000 of which are below pH 5 and fishless.
3. In the Adirondack Mountains of New York, 51% of the mountain lakes have a pH less than 5; now 90% of these lakes have no fish. During the period of 1929-37 only 4% of these lakes has a pH of less than 5 or were deviod of fish. Fisherman are no longer finding this region the paradise it once was. Tourists avoid the region for this reason.
4. Forest growth has been reduced in southern Scandinavia and in the northeastern U.S. between 1950 and 1970. Norman Glass of EPA estimates that forest production is off 14%. Seattle Times, March 8, 1979. The reason is uncertain but acid rain is a suspected cause. In this connection, however, laboratory and field tests have shown that acid precipitation can affect the germination of conifer seeds and the establishment of seedlings.

The problems of acid rain cannot be ignored. The Northern Tier facility will increase the burden of $SO_2$ for the area by 20%, and of $NO_x$ by 11% at the 933,000 barrels/day level, according to the data of Table 3.12-6. Local residents know of no acid rain measurements to have ever been made on the Olympic Oeninsula, nor has any modeling data been obtained. An approximation method for calculating rainfall pH on a multi-state scale has, however, been developed by Pacific Northwest Battele scientists. Along with the lowland areas the pH of the Olympic National Park's rivers and lakes should be taken and the pH of its rains and snows monitored. Then with the Battelle approximation method it should be possible for Northern Tier to forecast the future acidity of these bodies of water caused by the $SO_2$ and $NO_x$ pollutants. Pacific Northwest Laboratory Annual Report for 1977. (PNL-2500PT3 p. 1.23, Feb. 1978.) When the pH of these lakes and streams reaches 5.0 they will no longer support fish. For us on the Olympic Peninsula, this acidity hazard is fully as important as the primary pollutants, $SO_2$ and $NO_x$.

32 HYDROCARBON EMISSIONS:
It is stated on page 3-6 that "hydrocarbons by themselves do not prove to be a health hazard." This statement reveals a careless disregard of the facts. It may apply to the aliphatic or saturated hydrocarbons, but it does not apply to the aromatic hydrocarbons. And since 47% of the whole Prudhoe Bay crude oil consists of aromatic hydrocarbons, the impact statement must consider the effects of these compounds on the health of the community. Benzene, soot, tars and oils are listed among known chemical carcinogens. Because benzene, the simplest of the aromatic hydrocarbons, is on the list, it is highly likely that all of its derivatives, as well as all of the condensed ring compounds, present in the Prudhoe Bay crude oil, are potential carcinogens too. While these compounds are much less volatile than the saturated hydrocarbons used for gasoline, nevertheless they gain access to the atmosphere from spills on the water, on the land, and particularly at the tank farm. Hydrocarbons have been indicted by some as a possible cause of lung cancer. Port Angeles will receive a 36% increase in saturated hydrocarbons, but the cancerous aromatic hydrocarbon content of the air will be increased many-fold. A recent study found that lung cancer deaths in Texas, especially in the industrialized Houston area, had increased by 53% between 1969 and 1976. Environmental Science and Technology, 12 1356 (1978) The incidence of lung cancer is significantly higher in Texas than in the U.S. as a whole. The area is primarily in the petrochemical industry. While smoking may account for about 50% of the lung cancer cases, the question now is, can rapid population growth and industrial expansion account for the remaining 50% This the University of Texas does not know. There are several unknown factors regarding the health hazards of air pollutants. It is stated on page 3-6 that the saturated hydrocarbons are harmless, but what is not known is the toxicity of their oxidized compounds. These products are aldehydes and ketones and they would be expected to be of considerable greater toxicity than the hydrocarbons themselves. Furthermore, these compounds behave more like free radicals, and there is one school of thought that regards free radicals in almost any form as potential carcinogens. Science 202 37, 6 Oct., 1978. The remaining hydrocarbons, even without oxidation, are possible carcinogens, especially those in the aromatic and condensed ring systems. The problem here is the same as with that of radiation - what is the threshold? How dangerous are low doses? These matters have recently been discussed. Science 203, 522, 9 Feb. 1979. At the present time no one knows whether or not a threshold exists. A group correlated lung cancer deaths in twenty counties, including the U.S., which have varying degrees of air pollution. Environmental Science and Technology, 12, 1356 (1978). From this study the group concluded that lung cancer as indexed by benzopyrene correlated with lung cancer deaths even when cigarette smoking was eliminated as a factor. The group calculated that a microgram of benzopyrene/1000m$^3$ of air appeared to be associated with a 5% increase in the incidence of lung cancer. They also concluded that a 60% reduction in air pollution might result in a 20% reduction in lung cancer. An insidious property of the Prudhoe oil is its large fraction of aromatic hydrocarbons (48.5%) all of which are probably cancerous to man. As already stated, benzene is a carcinogen to man and the benzopyrene mentioned above is carcinogenic at less than one part per trillion parts of air. The residents of Clallam Coutny, particularly those of Port Angeles and Sequim areas, should be appraised of the potential hazard of these hydrocarbon emissions. A thorough treatment of this aspect of aromation hydrocarbon pollition must not be omitted from the Northern Tier Environmental Impact Statement.

33 Sec. 2.1.1 15-1
Defiency: Population: Figure 21.1.15-1 should be up-dated if possible because retirement influx has increased very considerably and this is pertinent to allowing increased air pollution: the compromised cardio-respiratory status of the aging population means human health effects at lower levels than anticipated by the EPA's recently more relaxed standards. The proportion of over age 50 years population in Port Angeles and in Sequim, less than 10 miles of and downwind from the tank farm should be ascertained and recorded.

34 Sec. 1.4
Defiency: For the diesel emergency generator: what is the past experience with frequency of use? Duration expected in hours of use per year? How frequently is their functional state tested? What is the noise factor at the site boundary? The air pollution level from diesel generator? What is the size of the diesel storage tank and how much of its vapor reaches the air?

35 Question: Will there be burning (on right of way) of brush or crops? Discuss control - if any- of air pollution from grading and other pipeline laying procedures.

36 Sec. 1.4
Deficiency: What type of paint will be used for the tanks at the tank farm and what amounts of solvent and other toxic materials will be released to the air from this source?

37 Sec. 1.4
Omission: Describe the emergency diesel generator: how big, how noisy, what emissions: Give the latter qualitatively and quantitatively. How often is this equipment operated aside from emergencies, to check on performance?

CONT

38 Deficiency:
Future Environment, page 2-154 Air Quality: since we are in a fact a SO2 non-attainment area (see page 2-5, also the EPA publication Washington Environmental Quality Profile, 1978 Fig. 1, Air Quality Status Map-By-County), it will have to be anticipated that air quality will be brought into line with provisions of the Clean Air Act. The EPA has already been petitioned to take formal action in this regard.

39 Sec. 1.4
Omission: What is meant by "to minimize hydrocarbon vapor emissions" when there can be no vapor recovery system as the floating roof descends exposing an oil-wet wall of the tank? Please describe each major type of oil to be handled with regard to chemical nature of all volatile hydrocarbons and the proportion of each in the vapors at 100 degrees F., hydrogen sulfide and other contamination odorants. and give the Reid vapor pressure for each of the major crudes. What will hydrocarbon vapor losses be from standing tanks on a hot windy summer day, assuming that Alaskan oil will be a full production and emerging at Valdez with a temperature of about 105 degrees F.? What will vapor losses be if this is combined with tank draw-downs accompanying maximal delivery for the FULL size project from tank farm to cross-continental pipeline?

Deficiency:
Visual Resources: Add consideration of view of the Olympics from distant points as Seattle and Canada and how this would be affected by suspended hydrocarbons and other pollutants in the air. Include view of the sky, currently blue most of the time, and the gray color of hydrocarbon containing smoggy skies, the brown color of nitrogen oxides floating above. Include the aesthetic value of looking down from Olympic National Park on a smoggy Port Angeles and Sequim-Dungeness valley. Include olfactory effects in the sensory impacts of the project. Include loss of sunlight energy falling on the earth and the generally reduced visual and sensory effects of this.

Page 2-48
Deficiency: Dispersion Potential: EIS should include that the influence of terrain and low mixing heights from the marine climate will accentuate the air pollution especially for Port Angeles and to a somewhat lesser degree for Green Point. The mountains rise relatively close to the sea at Port Angeles and when winds come from the north pollution is trapped much as it is in Los Angeles.

40 Page 2-48
Comment: Include Port Angeles in the $SO_2$ air quality violation areas (see p. 2-5). On very limited sampling, less that once a week, sulfur oxide maximum for 24 hour average has been found to reach 551 (State standard being 260 and Federal standard 365 for this finding). The one hour maximum has been found at a maximum of 2,593 with the comparable state standard being 1048 not over once per year.

Note that the high ozone readings in the Seattle/Tacoma areas can be influenced by hydrocarbons released at Port Angeles and Green Point with sunlight here in the "sun belt" acting on the material prior to its arrival in the metropolitan areas.

41 Page 8-10; 8-19
Question: What data base was used to assume meteorlogical conditions at Cherry Point and Burrows Bay are very similar to Port Angeles and the downwind area? The Sequim-Dungeness area is meteorlogically unique on the West Coast (i.e. driest spot north of San Diego on the West Coast).

42 Sec. 4; Page 8-29
Question: The BCM-DES declares that the highest concentration of $SO_2$ would occur several miles to the east. How many miles (or range of miles) are "several"? What is the impact on Port Angeles?

43 Deficiency: What will the effect of the 1% sulfur fuel oil have for the 1.283 million bpd throughout on air pollution in Port Angeles harbor and in Olympic National Park as compared with the figures used in the tables in this draft? (Didn't the tables assume this when they were drawn up?.) What would the values have been if this assumption were based on the usual bunker fuel oil?

Why is it deemed more important to avoid the Yellowstone River in Montana than the Dungeness River, the big and little Quilcene rivers, the Duckabush, the Dosewallips, Nisqually and Hama Hama in Washington? These Washington rivers all lead immediately to estuaries with wildlife refuges or food production or both. Was the decision on the Yellowstone environmental or political?

44 Page 1-52; item 27
Deficiency: It appears that cargo tanks may be purged 10 to 20 miles from Port Angeles harbor. This will be in the Straits, in an area where oil can be carried to Canada, and where currents carrying materials in a net-eastward direction can deposit the tarballs back towards Port Angeles. Please describe the areas to be contaminated in more exact and quantitative terms. For ballasting to the extent of 20% in Port Angeles harbor, how much oil fumes will be released to the harbor as a result? Why is it not a requirement that tankers have seggregated ballast tanks?

Deficiency:
Climate: the climate at Green Point differs considerably from Port Angeles and should be separately described. Rainfall is about 17 inches as compared to 24.6 at Port Angels. Wind patterns will also differ. Background air quality at Green Point is far better than at Port Angeles and the increment for significant deterioration will accordingly be a good bit smaller. Where is the background monitoring year round for this area? The greater amount of sunlight at Green Point will no doubt affect conversion of hydrocarbons to oxidants. In the absence of full air quality baseline data for both Port Angeles and Green Point worst-case assumptions must be made to protect the public interest. Mixing heights for Seattle would not be applicable for choosing mixing heights. A particular concern is distribution of air pollutants over Olympic National Park, Port Angeles and Sequim, such as hydrocarbons, nitrogen oxides, sulfur oxides , photochemical oxidants and particulates. Oxidant transport to the Seattle area which is a non-attainment area, would be expected within the 36 hour transit time set by EPA for evaluation of this type of pollutant. Since benzene is present in crude oil, is a known carcinogen and very volatile, therefore important to human health, the amount capable of release to the atmosphere and its concentrations and trajectories should be included. Baseline data should state the leukemia and cancer rate for Clallam County and a closer survey should be made in Sequim and in Port Angeles for incidence of these disorders so that effects of the project may be properly assessed.

Page 2-4
Deficiency: Include Seattle as a non-attainment area (see above). It is generally recognized that sulfur oxides contribute to acid rain at great distances and the extent of fallout from this should be stated and mapped.

CONT

45 Comment: It is incorrect that Port Angeles exceeds air quality standards only for particulates. The sulfur oxide standards have been exceeded on the few occasions they were measured. (See page 2-5). It is a gross distortion to imply that this condition occurs only immediately next to the source. The air is blue with fumes from the ITT plant particularly, over several miles at times.

46 Deficiency: Ozone has been studied in the Olympic National Park area. The reference should be traced and included.

Comment: Please give the meteurological and air quality monitoring data from Environmental Res. and Technology Inc. in the Technical Addendum for the final EIS.

Deficiency: Operation Phase: add calculation for full size of project. Comments for construction phase above also apply here. Please give full description of mathematical models used in a technical addendum. It must be noted that weather data at the Coast Guard Station is only applicable to the Port Angeles area and not to Green Point. What factors were monitored? Please include a table giving mixing heights for both the port and Green Point. Measurements of mixing levels have been done by ITT Rayonier with aircraft on 7/6/72, 8/2/72, 8/4/72; these values should be included. EPA's "Washington Environmental Quality Profile 1978" shows Clallam County in Fig. 1 as a county not meeint ambient air quality standards, and in Fig. 2 and 3 shows Clallam County exceeding the health standard for $SO_2$

In discussion this report notes that the rain shadow effect of the Olympic Mountains causes a sinking effect of the air on the lee side of the mountains which "also affects the ability of the atmosphere to disperse pollutants. The subsiding air results in the stabilization of an air mass, thus inhibiting the mixing process which normally helps to dilute pollutants". (pp. 35,36)

Deficiency: Please include all available data for background levels on $SO_2$, sulfates, total suspended solids, particulates, hydrocarbons, benzene, nitrogen oxides, and photochemical oxidants with respect to when and where measured, accuracy of the method to measure, and note capability of detection of 5 min. peaks, 1 hour and 24 hour maximum, and frequency of sampling. Then tell us how these would be affected by the operation of the project at the hospital at Port Angeles, at residences in Port Angeles, at Green Point and at Sequim. We believe there is grossly insufficient air quality data, that at least one full year of background collection of data is necessary (which could have been done because proponent has been considering this site for longer than that). The theoretical calculations made, leave much to be desired. The assumptions made should be given in this report as well as the worksheets. For background were actual emissions used or "permissible emissions" unrelated to the real world? Show the applicability of the model to this area. The EPA report referred to above, page 47, states: "The earlier discussion suggested that air mass stability at west coast locations like Port Angeles is likely to be more stable than the Pasquill system would indicate due to marine and subsidence inversion or influences."

47 Table 3.1.2-4
Deficiency: In Table 3.1.2-4 please give the comparable statistics for 1.283 million bpd throughput and the time (as the hours per year or 20% of the time if that is the figure) various emission rates would be exceeded. What are the legalities and law enforcement measures lying behind assurances that fuel used by the tankers would be 1% sulfur type? Physically how is this accomplished? Will the higher grade fuel be added to other fuel in the tanker's fuel tanks or will a separate fuel tank be used?

48 Please document from independent sources (Not NTPC!) data such as existing sources of air pollutants in Port Angels (Table 3.1.2-6)

49 Table 3.1.2-7
Deficiency: Please extend Table 3.1.2-7 to include the 1.283 million bpd throughput.

Deficiency: Please also include measurement of existing air pollution 1.7 miles ESE of the proposed port facility where impact is calculated to be highest.

Deficiency: Please detail the ambient air values (dates, method, and place of measurement) used in comparing the combined effects of background with the proposed project at Port Angeles. Was Was the instrumentation used for ambient air up to Federal (EPA) standards for accuracy or was it a bibbler lacking a necessary temperature control?

50 Comment: What would be the scenario for the worst case: three 300,000 DWT tankers unloading simultaneously under adverse weather conditions for the 36 hour unloading time? Over a 20 year plus lifetime of project this should not be dismissed as occurring infrequently; people breathe even on the less common bad days and cannot suspend this function even once in five years. It is the draft E.S. which is unrealistic when it refuses to give worst case emission rate combined with worst case meteorology. Impact should be studied not only to determine compliance with standards, but also regarding complicance with human health needs which those standards were promulgated to protect.

Question: What is the evidence that air stagnations and inversions in the Port Angeles area last no longer than the 6 hour time used in the valley model? Between June 3 and June 7, 1978, we had a prolonged inversion and air pollution values for sulfur dioxide exceeding 0.40 ppm on 11 hours scattered from 11 a.m. on June 3 to 9 a.m. on June 7, 3rd and Chestnut station, Olympic Air Pollution Authority measurement, listed as Method 13, using more conservative assumptions. Modeling may need to be repeated.

Deficiency: The type of particulates to be released by the project will be petrochemical carbon particles rather than road dirt. Carbon particles absorb sulfur and nitrogen oxides as well as other substances and concentrate these substances from the air. When breathed, the particles adhere to respiratory linings thereby greatly magnifying health effects over effects from pure gaseous pollutants studied in a laboratory situation. The BLM should discuss the impacts of the mix of pollutants on human health for background pollutants and for the changed mix resulting from the project. Such discussion should include the distribution of the mix as well as individual pollutants.

Deficiency: The nitrogen oxides emissions for the 1.283 million bpd project should be compared to existing emissions. Documentation is needed for the source of existing emissions. since nitrogen oxides and nitric acid can have health effects over a short period of time the maximum one hour and maximum 5 min. peaks should be given for ambient air and for project emissions.

126 CONT

Deficiency: Ozone formation due to hydrocarbon emissions is a major consideration for Port Angeles, for Green Point, for Sequim and for Seattle (36 hour travel time is part of the definition of area affected by hydrocarbons according to EPA regulations). Please calculate the pertinent figures for the 1.283 million bpd throughout. What levels of hydrocarbons will be encountered in the harbor, at the hospital, at the tank farm, at Sequim? How much benzene will be released to the atmosphere from the project in Clallam County and what levels may be expected in the above locations? There are persons hypersensitive to hydrocarbons who live in this area, having come here as a refuge from city air pollution. It is not true that hydrocarbons are without health effects. (Read the warning on any can of petroleum distillates if you have any question.) Please give ozone background levels especially in Olympic National Park, but also in Port Angeles. Show the pattern of plumes from the 36 hour travel of the hydrocarbons.

(51) Question: Are the hydrocarbon emissions based on only 20% of tankers without segregated ballast? How is tanker traffic to be limited to insure this proportion will not be exceeded? Why is it not a mitigating measure to require that all tankers using the port have segregated ballast? Will tankers use exhaust from their stacks to blanket oil being unloaded and reduce explosion hazard?

Deficiency: Please include modeling of dispersion for hydrocarbons and for ozone.

(52) Deficiency/Question: Please give technical data and cite references to substantiate a 40% reduction in estimated hydrocarbon losses from the floating roof tanks at Green Point. In the basic underlying studies in how many instances did the tank emissions exceed predicted values?

(53) Question: Please substantiate the validity of using a Reid vapor pressure of 4.0 psia and the temperatures of 97 F summer and 80 F in winter. What wind factors were used in calculating rate of vaporization? What are the Reid vapor pressures for each of the predominant types of oil to be put through? What is the chemical composition by classes of hydrocarbon for each of the predominant types of oil? Include benzene, aldehydes, sulfides, sulphonated hydrocarbons, ethers.

(54) Deficiency: Emissions of ozone levels based on two 190,000 DWT tankers discharging simultaneously is not adequate for disclosure of the probable actual emissions for a 3 tanker berth situation with 300,000 DWT tankers, thus does not provide a look at the full scope of the project early enough in the decision making process to meet the demands of NEPA. Further it should be disclosed what wind speed, mixing height, sunlight factor and temperature assumptions underlie the values obtained by modeling to obtain a value of 0.055 ppm in late afternoon at Ediz Hook and at Green Point.

BLM should document the assertion that emissions would be gaseous and invisible.

Page 3-7
Deficiency: Elsewhere in the document aerosol formation is discussed: certainly every major city can be seen to have grey skies and reduced air clarity. Even forests put off visable hydrocarbon emissions in the form of terpenes: it makes a blue haze. Please in the final EIS give a more accurate account of the visibility effects of the hydrocarbons to be emitted at the point of emission and after sunlight and associated air pollutants act on them. Please present the basis for your statement that reduction of visibility from the project would be "substantially smaller" (p. 3-7) from the proposed project than existing sources. Please give the combined effect of both. Discuss this in terms of a viewer in Seattle, and in Victoria as well as the view from Olympic National Park.

B

ALTERNATIVES

The Alternatives chapter of the BLM-DES generally is inadequate in the analysis provided. Alternatives on the national, state and local level are not addressed thoroughly. International, national and regional areas should be analyzed more completely for possible solutions to the problems of Northern Tier states shortfall and Alaskan crude surplus on the West Coast. All solutions and sites involving Washington State have been addressed in the DES; and, alternate sites within Clallam County for various facilities related to the oilport proposals have yet to be considered adequately.

Insufficient data is presented to form a basis for a decision as to whether the benefits of the project outweigh the potential environmental harm it might bring and whether it is needed at all. In addressing the question of need, the extent of the Alaska North Slope (ANS) crude surplus, the need and ability of refineries in the Northern Tier states to use the high-sulfur ANS crude, the ability of other pipeline systems to serve the Northern Tier states and the use of credits or exchanges to achieve the project objectives (reducing surplus ANS crude supplies on the West Coast and averting projected shortfalls of crude supplies to the Northern Tier states) must be addressed.

① Page 8-7.
Question: The BLM-DES declares: "Without the Northern Tier proposal, the excess West Coast supply of crude oil would continue." By this statement, does the BLM mean to say that no other alternative is valid?

② Page 8-11.
Question: If no mid continent system expansion occurs and the loop Drywater Port is completed, what will occur?

③ Question: What would be the impact of a product line from western Washington refineries to eastern Washington markets as proposed by Mr. Lawrence Bradley, Director, Washington State Energy Office? Would it eliminate the product shortfall projected by some parties?

④ Page 6-1.
Question: The first sentence in the lead paragraph raises a confusing point. If the short-term is the 20-year life of the project, how would the project be able to provide a long-term (more than 20-year) supply of crude oil to Northern Tier and inland states?

⑤ Page 8-56.
Deficiency: Statement: "The alternative route would probably follow existing corridors wherever practical." This language must mean the route is not clearly defined. How then can adequate assessment of impacts be made?

CONT

⑥ Sec. 8.1: Page 8-1.
Error: BLM states that the 4 Corners pipeline could be increased to 140,000 b/d throughput. Oil and Gas Journal, November 13, 1978, page 122, gives throughput expansion possible to 150,000 b/d.

⑦ Page 1-60.
Question: "The applicant must file a statement with the Washington State Siting Council certifying that the proposed project is consistent with the program." Has the statement been filed?

⑧ Page 8-104.
Omission: The Kitimat oilport proposal has been filed under appropriate U.S. Congressional legislation procedures.

Page 8-104.
Question: Has Kitimat now reactivated an application under Canadian National Energy Board procedures?

⑨ Page 8-49.
Question: Clearly define "Public preferences." What public, where, what groups or individuals? How many of the public must present or "preference" before a change is made?

⑩ Page 8-49.
Error: "Noise impacts associated with pipeline construction.... duration would be limited to five days." The "cross sound" pipeline will require more than five days of construction in the Port Williams staging area. This topic should be further discussed.

⑪ Page 8-104.
Deficiency: The Trans Mountain proposal has been filed under U. S. Congressional procedures.

⑫ Page 8-111.
Question: Statement: "220,000 d.w.t. tankers may be available in 1978" for the Jones Act fleet. As of March, 1979, how many tankers over 200,000 d.w.t. are available for Jones Act fleet? How many ships (200,000 d.w.t.) would be needed monthly to move the West Coast surplus around Cape Horn?

⑬ Page 8-113.
Question: Did Explorer pipeline complete expansion plans in 1978? 1979? What is current capacity versus current throughput?

Page 8-113.
Question: What is current status of Amoco extension of Texoma line (Cushing to Chicago)?

Question: What is the current status of potential looping of Capline?

⑭ Page 8-111.
Question: The pressure to expand Capline will come from the construction of the Loop Deepwater Port. DES notes Loop "is not yet under construction" but may be available by 1980's. What is the current construction schedule for Loop? Would Capline looping be expected to occur simultaneously or start after completion of Loop?

⑮ Page 8-112.
Question: "Chicap expansion should be completed in August, 1978." Was expansion completed? What is current capacity? Current throughput?

⑯ Page 8-113.
Question: Was Williams Brothers expansion to allow 120,000 b/d to Minnesota completed in 1978? What is current capacity? Current throughput? Status of current expansion plans?

⑰ Page 8-11; 8-28.
Question: Why will onshore storage require only 140 acres at Cherry Point and 300 acres (p. 8-28) at Burrows Bay? (Yet, p. 8-20 notes 140 acres for onshore storage for Burrows Bay).

⑱ Page 1-4.
Question: Prediction is for 1 million b/d surplus West Coast Alaskan crude oil by 1985. (Predicted by the NTPC paid consultant, PACE.) What do other sources project? What new major finds have occured since the Prudhoe Bay field in 1968 in Alaska to justify predictions of increased Alaskan production? If West Coast refineries retrofit to utilize Alaskan crude, what will West Coast use be of Alaskan crude?

⑲ Page 8-2.
Deficiency: Alternative energy sources must be addressed in order to evaluate justification of projected needs.

Deficiency: Increased domestic production and reallocation of existing crude oil supplies may meet much of the projected shortfall and this must be addressed according to Federal case law. (N.R.D.C. vs. Morton)

⑳ Page 1-51; 1-53.
Question: Table 1.4-22 notes line fill 13,740,000 barrels. Table 1.4-26 notes line fill 12,990,000 barrels. Why the difference of 750,000 barrels?

Page 1-32.
Omission: Did not address energy requirements for 1.29mil. b/d.

Page 1-51.
Omission: What is the cost estimate for 1.29mil. b/d (which would require three berths, etc.)?

㉑ Page 1-7.
Question: How does the oil shutdown in Iran affect these projections? How does Mexican oil availability influence projections?

Page 1-7.
Error: "Two fixed berths" addressed. The proposal should be evaluated at the three berth design and capacity.

㉒ Page 1-4.
Question: Has Canada agreed to continue sweet crude to 1982 at 55,000 b/d? What level of heavy crude?

Error: The proposed maximum throughput of 1.2mil. b/d should have been addressed by BLM.

㉓ Page 1-3.
Deficiency: PACE study under estimates potential throughput of Williams Brothers pipeline for crude oil.

CONT.

㉔ Page 6-9.
Question: Delivery to Washington state refineries would require: 2.1mil. barrels storage at North Bend. ("some other company to build pipeline segment.") Has the impact of storage at North Bend been addressed? Projected costs of this pipeline should be included in the BLM document. Who will construct this segment of pipeline?

㉕ Page 8-4.
Question: For most pipeline segments impacts are "similar to those identified for the proposed route." But, for the Jackass Ridge segment, "major environmental impacts on forest vegetation, wildlife, land use, transportation and utilities would occur." Does that mean impacts are greater? Further explanation is necessary.

Omission: Pipeline segments impacts would "be similar" to those identified on proposed route. Each chapter should be required to be complete within itself.

㉖ Page 8-2.
Question: Exchanges would cause further U.S. dependence on foreign crude. Does not the NTPC proposal also do that by planning on moving approximately 50% foreign crude to be economically viable?

Question: Why would exchanges with Japan "not service to relieve the West Coast surplus"?

㉗ Question: A crude oil shortage could cause initiation of combination of alternatives. What combination? If a combination of alternatives would work, why is not such an approach taken in this Environmental Statement?

㉘ Page 8-2.
Question: The recent U.S. Department of Energy supply/demand study, (February 21, 1979) does not substantiate the assumption that present trans-shipment of Alaskan crude would increase product costs.

㉙ Page 8-3.
Deficiency: BLM should substantiate the claim that 1100 barrels of oil could be spilled at Cherry Point as compared to 887 for Port Angeles.

Deficiency: BLM should substantiate the statement that 939 barrels of oil could be spilled at Burrows Bay versus 887 for Port Angeles.

㉚ Sec. 8.1; Page 8-1.
Error: Unit trains are not addressed because they will not handle 933,000 b/d. Federal case law, N.R.D.C. vs. Morton, holds that federal agencies cannot disregard alternatives simply because they "do not offer a complete solution to the problem."

㉛ Page 8-33.
Deficiency: Pipeline spill frequency is not consistent because different pipeline miles are used. To give a clear picture, all sites must be calculated with a common denominator. (i.e., for 100 pipeline miles)

㉜ Page 8-3.
Deficiency: The BLM-DES states that 914 barrels of oil could be sipped at Freshwater Bay versus 887 for Port Angeles. This statement should be substantiated.

㉝ Deficiency: No comment is made regarding the area affected by oil spills. Yet, it was mentioned for the Low Point site alternative. Both sites should be evaluated upon similar criteria.

㉞ Question: The BLM-DES contains a statement regarding ".... the most desirable oil trans-shipment ports with the onshore pipeline passing around Puget Sound." Does this mean to infer that the around Puget Sound pipeline route is more desirable than the cross Puget Sound pipeline route?

㉟ Omission: The four sites of Cherry Point, Burrows Bay, Freshwater Bay and Low Point should be analyzed as to compliance with local government land use plans and shoreline plans. It is noted in discussion (p. 8-17, Cherry Point is consistent with land use plan). Such information should also be noted in the summary.

㊱ Page 8-3.
Question: Paragraph 2 and 3, Clallam County to the east of the proposed site at Green Point is similar to Burrows Bay in that it has negligible industry and has important marine and terrestrial resources and like Freshwater Bay, the area has relatively little development. Are the impacts at Port Angeles and Green Point equal to or greater than the impacts at Burrows Bay or Freshwater Bay? BLM should further analyze this issue.

㊲ Question: Are there potential onshore storage alternative sites in Clallam County which were not in conflict with the County Comprehensive Plan when the Northern Tier Pipeline Co. initiated its project? Also, there are several sites in Clallam County which better comply with the industrial site standards in effect at the announcement of the project.

㊳ Page 8-4.
Deficiency: Define specifically what constituted "major public and governmental opposition" to Stampede Pass segment of the pipeline.

㊴ Omission: The BLM should quantify and specify what "public opposition" to the Coeur d'Alene route segment.

㊵ Page 8-5.
Question: The BLM-DES declares that "only viable alternatives capable of utilizing West Coast crude oil surplus to meet the demand in the Northern Tier states were given final consideration." Does West Coast crude oil surplus mean Alaskan crude? What percent of total capacity of the Northern Tier states can use Alaskan crude? If they require largely "sweet" crude, is the above statement a valid criteria for sole consideration of alternatives?

㊶ Page 8-7.
Omission: The "no action alternative would foreclose the opportunity of supplying the Puget Sound refineries from the North Bend area" (there is no such line presently existing). Reference should be made to Trans Mountain Co., which has always served Washington refineries. Exchanges with Canada would allow use of the Trans Mountain line and reduce tanker traffic.

CONT.

㊷ Page 6-3.
Question: "The trade off would provide short term economic benefits in exchange for a change of life style with some risks to present and future recreation, commerce and possibly health and safety because of air quality degradation and potential risks of major oil spills, fire and explosions." This sentence speaks mainly to the Port Angeles area. Does the federal government or any other government unit for that matter, have the right (authority) to overrule the local community and subject that community to those risks? Isn't one of the reasons for government to protect the health, safety and general welfare of its people?

㊸ Page 6-3.
Deficiency: The section should note the allegedly illegal procedures exercised by then Governor Evans to add a statement after the final EIS on Washington State CZM policy, without proper public hearings. Notation should also be made that the state CZM policy, without Evans' statement precluded trans-shipment of oil in Washington state. Also the BLM should acknowledge Governor Ray's reasons for requesting removal of the Evans amendment.

㊹ Sec. 1.4.
Deficiency: The cost of contingency plans and measures should be included under costs and reflected in projected tariffs. This cannot realistically be postponed to the construction phase of the project because these costs in addition to all the other costs may help to determine the economic viability of the project.

㊺ Deficiency: Balance of payments problems will not be helped by import of foreign oil, an integral part of this proposal and this should be weighted as a cost of this project.

㊻ Question: It should also give the corporate structure and indicate the financial capability of the NTPC. Will there be marketplace competition for supplies such as pipe or will one of the consortium members by supplying the pipe on a non-competitive basis? What about other aspects of the port and pipeline construction? How will the consortium members and their interests affect the costs of the project and how will those interests affect the ultimate scope of the project?

㊼ Table 1.4-27.
Deficiency: Table 1.4-27 should be reconstructed when more realistic costs are developed.

㊽ Sec. 1.4.
Deficiency: Please include costs for the 1.283 million bpd project. Please also include for all three project sizes, costs for escalation, interest during construction, cost of line fill (13,174,000 bbl.) working capital and debt expenses. Since this is a new line, these costs are relevant in comparing costs of this alternative with other alternatives which are connecting smaller lengths of pipe to other existing already-filled, already-financed pipelines.

㊾ Deficiency: For operating costs give projected costs for power at the time of start up and five years later. Power costs are rapidly escalating and the DES does not seem to allow for this, the base used in all these calculations should be given in a technical addendum. Ten percent contingency seems very low: what is the cost over run historically for other recently constructed pipelines of like size? (Alyeska's overrun? Why should this one be different?) Where is the provision for dismantling at end of project? For compensation in event spills damage water shed or fisheries? For clean up operations in event of spills? For insurance and performance bonds? The numerous stream and river and highway crossings will involve extra expense; how do these figures reflect that? Should the project be delayed by strikes or lawsuits will the cost figures for contingencies be sufficient? Give specifics as dollars per day for delay before, during construction and recent historic record of delays for large construction projects. What special items are likely to cause delay for want of the proper construction material at the right place when needed (specialized construction equipment, materials, skilled labor, etc.).

㊿ Omission: In calculating sales tax, local and county sales taxes should be included in addition to the state sales taxes.

(51) Deficiency: In the Technical Addendum, please include the basic data and the calculations used in the Department of Energy cost analysis which is used as a basis for your figures. The Department of Energy Study was updated and expanded between May, 1978 and the fall of 1978 and we would like to know the point at which the figures presented were drawn. It is hard to believe that list prices for pipe in 1978 are "conservatively high" considering that purchase of pipe couldn't possibly begin for at least a year from that date. Please justify this, giving figures for price of pipe and labor in construction year by year for the last several years.

(52) Question: Where is there provision in cost estimates for costs of mitigating measures which might be very expensive such as relocation of the Port Angeles hospital, compensatory fish hatcheries, requirement for double hulled tankers with all segregated ballast, need to offset air pollution in Port Angeles, double walled pipe under all streams, rivers and other underwater locations, restriction of tanker size from Cape Flattery east and tug escort, use of less than 0.5% sulfur oil for all vessels in Port Angeles Harbor, pick up all fire and explosion hazard insurance premiums in excess of current rates as caused by the project, bonds to cover oil pollution both marine and water table should there be a spill, etc.?

(53) Page 62; 63.
Deficiency: It is a matter of several public records and general public knowledge, that the question of Washington State refinery hook-up is fundamental issue involved with the Northern Tier Pipeline proposal. The proponent does not commit himself to supply of Washington refineries. See page 1-62 and 1-63: In order for the refineries in the Puget Sound area to utilize the system, some other party or parties would have to construct an 80 mile long pipeline.... NTPC does not propose to construct the modifications at this time or construct the connecting pipeline or to operate the pipeline....Recent (3/22/79) amendments to the NTPC proposal (i.e., "Cross Sound pipeline") should require a Supplemental Environmental to be issued. The BLM-DES is very inadequate in its limited consideration of what has now become a major element of the NTPC proposal. The NTPC waited until after all of the BLM public hearings to announce the significant amendment of selecting the new

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(53) pipeline route. Because the new route was only mentioned superficially in the DES and because the selection and possible utility of the route will have significant environmental, economic and social impacts, at the minimum a supplemental Environmental Statement should issue addressing a proper evaluation.

Deficiency: The applicant should provide the analysis involved in its selection of proposed transmission corridors and efforts made to avoid scenic, recreational, historic, archaelogical and heavily timbered areas, steep slopes and proximity to highways to minimize conflict between the rights-of-way with present and future uses of the land on which they are located. In addition, the spirit and letter of the National Environmental Policy Act (NEPA) clearly mandate full evaluation of all realistic alternatives. BLM has failed to adequately address alternative pipeline routes. The analysis of the alternate route (cross Sound), is very inadequate. With the amended plans of NTPC indicating this as their new primary route. This inadequacy should require a Supplemental Environmental Statement.

Deficiency: The BLM should include in its analysis:

1. Full disclosure of the process used by the applicant to arrive at the "cross-Sound" crossing proposal
2. Complete and objective analysis of all reasonable alternative routes (at least up to the standard of analysis required by NEPA and SEPA for projects of far lesser consequence).

(54) Sec. 1.1.
Deficiency: Further discussion of delivery facilities to other pipelines is needed. What agreements or contracts exist to allow connections to Glacier, Western Crude, Amoco, Lakehead and Minnesota pipeline systems? Does "access to 50 refineries with a capacity of 3.6 million bpd" define the ultimate extent of this project? If so, please calculate impacts for this figure. If not, why is it mentioned?

(55) Deficiency: The BLM should address, in considerably more depth, the various solutions to the problem of surplus Alaskan North Slope crude oil on the West Coast of the U.S. The TransAlaska Pipeline System is authorized by federal permits to move 1.6 million b/d. New discoveries would be required before an expansion above that level could be justified. West Coast refineries can presently utilize 700,000 b/d of Alaskan North Slope (ANS) crude. Secretary of Energy, James Schlesinger, has promoted government incentives to retrofit West Coast refineries for maximum utilization of ANS amounting to 1.5 million b/d. Additional solutions to the problem of temporary surplus of ANS on the West Coast would include:

1. Encourage industry to design and construct all new refineries to handle ANS
2. Exchanges with Japan and Mexico
3. Restructure of entitlement program to provide incentives to West Coast and Gulf Coast refineries to utilize domestic oil
4. Retrofit West Coast refineries beyond Department of Energy proposals to convert to ANS processing.

Page 8-7.
Omission: The BLM-DES did not consider reallocation of indigenous crude oil.

Deficiency: BLM did not consider increased domestic production, despite significant industry and public coverage of this topic. Oil and Gas Journal articles (1977 and 1978) regarding Overthrust Belt, Montana and North Dakota.

Omission: BLM omitted reference to new U.S. Department of Energy regulations designed to raise domestic production. (Oil and Gas Journal, January 8, 1979)

(56) Sec. 1.2.
Omission: Please give source for the statement that production is declining in "Northern Tier, Rocky Mountain and Midwest regions" in spite of Williston Basin and Southwest Wyoming production, and indicate whether this is for reasons of physical availability or has to do with market relationships and contracts. Give the indiginous production for each of these market areas and the exports out of each of these areas to other markets.

(57) Omission: The issue of continued oil supply on the West Coast and demand for oil of high sulfur content in the northern and central U.S. are pertinent to the cost estimates since a 25 year operating life at full rated capacity is used in making tariff estimates. The EIS should contain in its technical addendum an indication of firm contracts for purchase of the oil.

(58) Section 1.1.
Deficiency: Please specify the market area and indicate what contracts already exist for use of the oil (customers of Northern Tier Pipeline Co.). Specifically what is the firm demand for the high sulfur Alaska product? Further, what is the demand for foreign oil at the anticipated cost of delivery? Please give in a technical addendum the full basis for costs of both types of oil delivered to pipeline customers.

(59) The BLM-DES is deficient as far as data which substantiates the need for the project as comparable to the Canadian National Energy Board Study and as required by the National Environmental Policy Act.

Deficiency: The U. S. Department of Energy recently conducted a supply and demand study for this area. Although at least preliminary findings were available to the BLM last summer, such data was not included in the DES. Why was it not included (the material could have been noted as "preliminary")?

In an effort to independently analyze need for the NTPC project, refiners in the northern tier states have been surveyed by mail. The following representative comments address the issue of need for the project:

> "We do not intend to support it with throughput commitments at our refinery at St. Paul and we know of no refiner who is willing to enter throughput agreements with the Northern Tier Pipeline." (Letter from John Dee Roper, Koch Refining Company, January 29, 1979)
>
> "We do not agree with an oil receiving location inside Ediz Hook. We believe that the problems of congestion, air quality control and consequences of possible oil spill are not compatible with the present development in that area." (Letter from E. A. Hall, Trans Mountain Oil Pipe Line Corporation, March 5, 1979)

CONT

> "From studies we have conducted in 1976 and 1977 and updated as recently as January, 1979, it is our belief that the primary midcontinent supply will continue to come from the Gulf Coast. A West Coast oil port and pipeline will carry only the sweet crude oil requirements of the Northern Tier States, amounting to some 100 - 150,000 barrels per day, plus the Alaskan North Slope surplus which can be utilized in refineries in Minnesota and Chicago areas. We agree completely with the DOE report which establishes the supply and demand of that ANS surplus at 300 - 350,000 barrels per day. This is why we have contended throughout that a West Coast facility to handle anything larger than 400 - 500,000 barrels per day is not only unnecessary but refuses to recognize that it could not compete with Gulf Coast supply alternatives. (Letter from E. A. Hall, Trans Mountain Oil Pipe Line Corporation, March 5, 1979)
>
> "We anticipate that the initial 1.4 million barrel per day capacity of LOOP will, in part, be utilized to supply crude oil to local Gulf Coast refineries. We would expect that the balance of the throughput would be transported through the existing Capline system replacing some of the existing transshipment operations in the Caribbean. (Letter from Larry C. Thomas, Standard Oil Company, January 31, 1979)
>
> "Sohio's studies of crude oil supply and demand in the U. S. Upper Midwest indicate the possibility of a shortfall of 50-80,000 barrels per day in the entire Ohio/Michigan area by 1985."
> "Sohio anticipates that in the future the majority of crude oil supplies for its Ohio refineries will continue to be supplied via the existing crude oil system from the Gulf Coast."
> "In addition to deliveries to Sohio's refineries, Sohio would possibly be involved either directly or indirectly in the Northern Tier or Upper Midwest states. At the present time there volumes and ultimate destinations are impossible to quantify accurately since they depend on the future West Coast market, future ANS producing levels, etc..
> "We have not made and have no current plans to make either firm or semi-firm commitments to Northern Tier Pipeline Co. to utilize their project as a supply source. (Letter from D. W. Parry, The Standard Oil Company, December 20, 1978)
>
> "Sohio's Lima Refinery cannot be supplied with crude oil from the North with existing pipeline connections even if the Northern Tier Pipeline is built." (Letter from D. W. Parry, Standard Oil Company, December 20, 1978)
>
> "We are actively trying to acquire more of these crudes and along with others, Exxon, USA supported the reversal of a segment of Platte Pipeline which will make more heavy crude available to Billings. Exxon is also actively pursuing additional volumes of newly discovered domestic light sweet crude to replace the light Canadian crudes. Some time ago we completed arrangements whereby we exchange domestic crude for light Canadian crudes to help meet our light crude requirements. North Slope crude could be used as a supplement to our heavy crude supplies but could not be used as a replacement for light Canadian crudes. We do not foresee a crude shortfall at Billings between now and 1980." (Letter from S. J. Vastola, Jr., Exxon Company, U.S.A., December 5, 1978)
>
> "As we have indicated on numerous occasions, both in public forums and in written statements and letters, Shell has no interest in the proposed NTPC system, either for Puget Sound needs of for Mid-Continent needs. We do not oppose NTPC's endeavors other then our specific opposition to a mandated hookup of our Anacortes Refinery to this system. We continue to believe that direct marine deliveries to Anacortes are safe, environmentally responsible, and attractive economically. To illustrate this point, I am attaching copies of some of our recent correspondence on this issue."
> "Our Midcontinent facilities, located at Wood River, Illinois, are adequately supplied through pipelines already servicing the area. Our Anacortes, Washington refinery receives the majority of its crude oil by tanker."
>
> "It has been suggested that Shell might wish to use the services of Northern Tier to deliver raw material from Port Angeles to Anacortes. We have publicly voiced our opposition to this play to costly to the consumer and unwarranted by environmental considerations. We continue to be opposed. Marine service is the most cost effective method of raw material supply to this refinery, and no plans exist at this time for converting an alternate method." (Letter from W. A. Melsead, Refinery Manager, Shell Oil Company, November 20, 1978)

The BLM should provide specific possible solutions as to how the Northern Tier states be supplied. For example:

1. Montana: Requires 156,200 B/D (1978)

| | |
|---|---|
| A. Produces | 89,512 B/D (1977) |
| B. Exports 71.1% of in-state production (1978) | |
| C. Wyoming supplies | 53,800 B/D (3/78) |
| D. Reversal of CONOCO pipeline | 35,000 B/D (2/79) |
| E. Canadian condensates | 60,000 B/D (1977) |
| F. Accelerated exchange program with Canada. Increased oil discoveries in Alberta enhance this possibility. In the first 2-months of 1979, the National Energy Board approved exchanges totaling 5.9 million barrels. | |
| TOTAL | 238,312 B/D |

2. Wyoming: Requires 188,600 B/D (1978)

| | |
|---|---|
| A. Produces | 306,211 B/D (1977) |
| B. Exports 60.9% of in-state production (1978) | |
| TOTAL | 306,211 B/D |

3. North Dakota: Requires 58,600 B/D (1978)

| | |
|---|---|
| A. Produces | 63,542 B/D (1977) |
| B. Exports 41.7% of in-state production (1978) | |
| C. Williams Bros. pipeline system could supply crude through reversal of the Minnesota and Portal pipelines. | |
| D. Reversal of the AMOCO product line (FEA 1976) | |
| E. The recent discoveries of potential large crude reserves in Southwestern N. D. may dramatically reduce any potential shortfalls (OGF 2/21/79) | |
| TOTAL | 63,542+B/D |

CONT

4. Minnesota: Requires 216,000 B/D (1978)

| | |
|---|---|
| A. Northern pipeline reversal from Wood River, Ill. to the Twin Cities will provide 175,000 B/D; capacity could reach | 230,000 B/D |
| B. William Bros. supplies | 120,000 B/D |
| TOTAL | 350,000 B/D |

## ARCHAEOLOGICAL/HISTORICAL

C

① Sec. 3.1.10; Page 3-35.
Deficiency: How can the cultural impacts be properly assessed if no comprehensive, detailed resource inventory has been made?

Sec. 4.10; Page 9-5.
Deficiency: The exact procedure for resource identification and preservation should be spelled out.

Sec. 1.4; Page 1-41.
Question: Since it is apparent that a relatively strict construction schedule is planned, what type of allowance is going to be made for resource recovery at the Green Point site?

Sec. 2.1.1.10; Page 2-27.
Omission: The proximity of the tank farm to the mouth of Siebert Creek would increase the possiblility that an early Indian settlement was once located there.

② Sec. 5.1.10; Page 5-7.
Question: If adequate mitigating measures are implemented, why will resources be lost? Does this mean that the mitigating measures will be construction schedule dependent?

③ Question: It is presumptious for Norhtern Tier to speak of values in an area which is of no concern to them other than in a business sense. Value speaks of a deep underlying commitment as perceived by a people who identify with an area holisitically. What local participation will be utilized to judge the value of cultural resources effected by the project?

Question: Who will survey cultural resources? What credentials are proper in this field?

Comment: Local residents should help select those persons and spot-check the survey at unannounced times to maintain objectivity.

Question: Who will insure that professionally qualified individuals are also objective in their analysis of cultural resources?

④ Deficiency: A more detailed discussion of native American traditional hunting, fishing and living areas should be included in the document. Particularly this is relevant to the Klallam Indian tribal lands which extend from Hood Canal to the Hoko River. Makah Indian tribes; lands should also be further discussed.

Deficiency: Inland locations of Indian cultural resources should be addressed further.

## EASTERN CLALLAM COUNTY

D

Comment: Many comments related to impacts of the NTPC proposal related to the west end of Clallam County are presented in other segments of this report under relevant topic areas.

① Deficiency: Some impacts of the pipeline would vary depending on the resources present in specific areas along its route; however, the risk of oil spill or leakage is of concern along the entire route. Related concerns are remedial actions in the event of a spill or leak and the extent of Northern Tier's responsibility in such an event.

Concerns center on stream crossings and potential impacts to marine and freshwater resources including groundwater. Also, concerns relate to the severe effects that an oil spill or leak could have on irrigated farm lands downstream of the pipleine. Erosion, river crossing protection, dust control, extra-heavy equipment use of county roads, lack of a source of rockless dirt in Clallam County for fill around the pipeline, lack of protection for farm animals, and quality control for the county during construction are construction-related concerns significant to Eastern Clallam County residents. Mitigating measures should be proposed to cover these concerns. A much more thorough analysis of such impact areas should be performed by the BLM.

Comment: Presently the pipeline corridor lies within a two-mile wide corridor. Particular problems which may develop within the corridor, once the exact pipeline route is designated, cannot be addressed until such time as the exact route is designated.

② The recent amendment by the NTPC, including the change to a new pipeline route in Eastern Clallam County, has been announced with less than one week remaining prior to the deadline for submittal of written comments to BLM. The DES provides a very inadequate analysis of the alternate route, and additional information has not been available from NTPC on this topic. Also, the amended plans were announced after the completion of the BLM public hearings which resulted in very little public comment on the route change.

Table 5.1.15-1; Page 5-12
Deficiency: Fire protection impacts must be further discussed by the BLM. The DES is very deficient in this area of impact. Additional training and equipment will be necessary. Fire-fighting capabilities in Clallam County are not prepared for oilport terminal, tank farm, or pipeline fire-related problems. Further discussion of fire protection, including Fire District #3 (Eastern Clallam County), is contained in the "Fire Protection" section of this report.

③ Deficiency: Inadequate analysis has been performed regarding the "Cross-Sound Pipleine" route impacts related to the public boat launch facility at Fort Williams.

④ Page 8-51
Omission: No mention of impact on Hurd Creek Fish Hatchery for the "Cross-Sound" alternative.

⑤ Page 8-54
Omission: No discussion of submarine pipeline spill impact on Sequim Bay. This area has a slow flushing action and contaminants could build up.

CONT

⑥ Also, no discussion of impact of submarine pipeline spill on the commercial oyster beds in Dungeness Bay.

⑦ Omission: A very significant impact, resulting from the route amendment, involves the probable relocation of the pipeline construction staging area formerly planned to be located at Discovery Bay in Jefferson County.

⑧ The additional commuter traffic, freighting traffic, primary and secondary work-related populations, etc., will significantly increase the impacts on Eastern Clallam County. The location of equipment storage, stock piling, coating facilities (if necessary), etc. have not been announced. Hence, no analysis is possible. This shortcoming of the DES would be another justification for a supplemental environmental statement.

## EMERGENCY SERVICES

E

① Page 2-44.
Omission: Law enforcement is only addressed as far as jail facilities and uniformed personnel. Should also discuss planned security and evacuation plans.

Page 5-23.
Omission: Table 5.2.15-1 Impact of operation does not address the problems of security, sabotage, fire evacuation, and explosion recovery.

② Page 1-16.
Deficiency: The fire fighting road system is not adequately addressed. One access road and partly on the dikes.

Page 2-44.
Deficiency: Water limitations and manpower needs are not addressed adequately. See: Coast Guard report on Long Beach ship explosion/fire, p. 14, (report 16732/71895): "Altogether the Los Angeles Fire Dept. utilized 5 fire boats, 9 rescue ambulances, 2 helicopters, 2 tankers, 2 light utility units, and various misc. equipment. Five task forces and two single engine companies were held in reserve. Five task forces and fire-fighting personnel were actively engaged in the operation." (Note: this does not include Coast Guard equipment--which other sections of the report discuss.)

③ Page 2-41.
Deficiency: Table 2.1.2.15-1. Fire protection volunteers registered with Washington State Board for Volunteer Firemen 1978 are not the same figures for those trained. In 1977-78 Fire District #3 requested more volunteers.

④ Page 2-144:
Deficiency: See above comment: This statement is not accurate for Clallam County.

Page 2-157.
Deficiency: This statement is accurate to the degree that unless more flammable products are in the harbor the increase in log and timber export would not increase the hazard risk of the harbor.

⑤ Page 3-53,54.
Deficiency: Construction phase statement is accurate. Operation phase statement does not adequately add the required fire forces needed. (See: Comment on Sect. 2-44)

⑥ Page 5-9.
Error: Table 5.1.12-2: Tanker explosion in harbor statement does not hold with all known factors of tanker explosion damage. This is a gross understatement. Fire has been shown in past tanker and storage facilities to have a greater impact.

⑦ Page 5-12.
Deficiency: Table 5.1.15-1: Referring to 2-44 comment, this is a gross understatement.

Page 5-23.
Deficiency: Table 5.2.15-1. Operations. A major explosion or fire could strain local facilities is an understatement. (See comment on 2-44)

⑧ Page 6-6.
Deficiency: Table 6.3.2-4. One explosion casualty every 4.69 years and a fire every 9.18 years in harbors. This table points up the inadequacy of the proposed addition by Northern Tier for additional fire protection.

Page 6-8.
Comment: Tabel 6.3.3-2. This table consists of statistics from the Oceanographic Commission of Washington, whose credibility is questioned elsewhere in this report. They do not take into account the increased number of tank farm fires in the last few years which has increased radically.

Comment: The Statement does not address the explosion or major fire concept adequately. No plan or method of warning is included. Section 2-44's answer to fire protection is the just major emergency problem with the lack of manpower, equipment and time, all three elements of a disaster. The second major problem would be the evacuation of areas from the lower section of the city and the areas along the bluff. Any explosion in the harbor will produce a shock wave which would have no resistance over water with the full effect along the shoreline into the central area. The Coast Guard Report, 16732/71895 notes that minor damage extends 3 to 6 miles from the explosion with the shock wave traveling overland. The 200 ft. height of the bluff would have very little deterioration power of the wave and might reinforce it due to energy uplift from the surface front. A shock wave from Ediz Hook would extend into the atmosphere as far as it would extend in all directions from the center of the explosion. Therefore a shock wave reaching the shoreline would be high enough to damage the structures on the bluff, including the Hospital, and possibly cause the chlorine at ITT-Rayonier to rupture.

Sec. 1.4. Page 6-6.
Deficiency: That we should be prepared for an explosion in the harbor every 4.69 years and a fire every 9.18 years is a bleak prospect that poses special problems since the only hospital for 46 miles around sits almost at the edge of the harbor entrance, less than 200 ft. from the water. This matter should be further discussed in the text.

⑨ Page 3-41.
Deficiency: The paragraph concerning risk of fire and explosion is unconvincing, at best. First, what is the increased risk with a third berth? Second, what percentage of explosions alone (not combined statistically with fire) result in onshore property damage in excess of $1,000. Third,

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⑨ what percentage of inport explosions result in such property damage? Fourth, what percentage results in loss of human life? Fifth, what percentage of explosions specifically in Port Angeles harbor would result in loss of life and property damage? It is very hard to accept an unsupported statement that a Bantry Bay or California type explosion could not occur in Port Angeles, with a resulting loss of life, medical facilities, emergency air transportation (U.S. Coast Guard), etc.

Question: Use of segregated ballast tankers alleviates fire and explosion risk, but such tankers comprise less than half of the world's tanker fleet. What percentage of the NTPC fleet would be equipped with segregated ballast?

Deficiency: Accidents such as tanker explosion, pipeline rupture, storage tank rupture, and fire are dismissed as "rare" and "not expected." These events do occur and should be addressed.

⑩ Question: An emergency procedures plan for NTPC should be part of the application. How are the NTPC facilities protected from sabotage?

⑪ Question: Do any national, state or local governmental regulation control the minimum distance from a school, hospital, etc., upon which an explosive operation can be conducted?

⑫ Question: What is the increased explosive risk due to tankers without inerting systems?

Page 1-54.
Deficiency: The contingency plan and comprehensive emergency plan should be a mandatory part of the environmental statement. It could be refined later.

Page 1-55.
Deficiency: The list of Agencies telephone numbers should include Clallam County Department of Emergency Services.

⑬ P. 3-41.
Question: Based on the recent Bantry Bay, Ireland tanker explosion at an offshore unloading berth, how can such minimum damage be expected from a worst case fire or explosion in a small enclosed harbor, filled with other vessel traffic, including passenger ferry, and rimmed by residential areas? Harbor is only one mile wide at harbor entrance.

Deficiency: Does not speak to tanker explosion or fire related to worst case tanker fire or explosion with tanker in turning pattern and impacting shoreline structures, such as local mills where hundreds of men work daily.

Page 3-41.

Deficiency: Does not speak to smoke impact from tanker fires.

Deficiency: Does not speak to fire and explosions related to fuel barges.

Page 3-39.
Question: Comparing potential for explosion damage to Bantry Bay 1979 tanker explosion offshore, what is basis for statement an enclosed in-harbor explosion worst-case explosion should be limited to shoreline and adjoining land uses?

Page 3-41.
Deficiency: Explosion and fire risk statistics given for two berth installation. What would increased risks from three berth and related tanker traffic be?

Page 3-51.
Deficiency: Distances for damage fires and explosions listed as substantial for equipment, vessels and personnel within a radius of 3 to 4 thousand feet. Reference for this paragraph furnished by Mr. Booth of BLM says it is based on Vol. 5, part 1, Site Cert. parg. B.11-77. The Site Certification lists the distance from center of the harbor to Northern Border of town as 3900 feet. Center of Harbor to Northern Log Booming Area as 2400 feet. Tanker Berths to Radio Beacon at Eastern End of Spit 6,600 feet. Tanker Berth to middle of U.S. Coast Guard Base as 4,800 feet. Does not list distance from middle of Harbor to Southern shore of town. Does not speak to number of people maximum total in harbor area daily.

F

## ENERGY

① Electrical Power is one of our great concerns because of the uncertainty as to the availability of power within the next few years. Bonneville Power Administration served the City with a notice of insufficiency approximately two years ago in order that we might have plenty of time to make other arrangements to meet our needs. The City contracted with the Washington Public Power System to supply the amount we required above the amount available from BPA. This contract did not include any power for Northern Tier and there is a serious question as to whether it will be adequate to meet our needs resulting from normal growth. Some of the basic questions that remain unanswered in this area are:

a. Is there a power source other than Port Angeles from which Northern Tier can secure its electrical power?
b. In the event of a power shortage would the City Council retain the right to allocate power among the different users?
c. If Northern Tier were to secure their power through the City for the marine terminal, would this power be at the hydro-electric rate or at the thermal power rate?
d. If Northern Tier cannot obtain the necessary electrical power and must resort to diesel fueled combustion turbines, can the exhaust be treated in such a way that it will not contribute to air quality problems in Port Angeles?

② Sec. 2.1.1.13; Page 2-36.
Deficiency: Uncertainty over future availability of electrical power to supply the needs of Port Angeles City Light and Clallam County P.U.D. even without the substantial requirements of Northern Tier is cited. Discussion of the impact, both short and long term, of limited electrical power on the area is inadequate. Comparison of the job-producing potential of the pipeline per unit of energy consumed with that of other industries desirable for sound economic growth of the area is needed.

③ Sec. 2.2.2.13; Page 2-162, 163.
Error: Under "Electric Transmission" on page 2-162, it states that Table 2.2.2.13-2 shows the P.N.U.C.C. West Group Forecast of power loads and resources for March 1, 1978. Table 2.2.2.13-2 on page 2-163 shows only probability of power insufficiency for forecasted years.

CONT

④ Sec. 1.4; Page 1-10.
Deficiency: No discussion is presented on the source and type of energy which would be required in case a shipload of oil required reheating before it could be pumped through the pipeline system.

⑤ Sec. 2.1.1.13; Page 2-35.
Omission: Statement implies that a new 69 KV transmission line from the base of Ediz Hook to the unloading dock will be required. Neither a description of the line (overhead, underground or submarine) nor a discussion of its impact on the Hook's stability and use is given.

⑥ Sec. 2.1.1.13-5; Page 2-36.
Deficiency: Table 2.1.1.13-5 describes Port Angeles City Light and Clallam County P.U.D.'s present and forecasted loads but it does not state which years the forecasted load is prediciting.

⑦ Sec. 2.1.1.13; Page 2-36.
Error: The availability of thermal power from W.P.P.S.S. as described in first paragraph on page 2-36 is incorrect, since all five nuclear power projects have had rescheduling of target dates for commercial operation. The new dates for commercial operation of the five nuclear power projects are as follows:

WNP-1 - December, 1983 WNP-2 - September, 1981
WNP-3 - December, 1984 WNP-4 - June, 1985
WNP-5 - June, 1986
(Taken from WPPSS news Release No. 79-13, January 26, 1979).

Sec. 1.4; Page 1-10.
Deficiency: Statement mentions construction and use of a diesel-powered emergency electrical generator. Size of the generator and estimated frequency of operation should be given to permit evaulation of impact on air quality and noise level.

Sec. 1.4; Page 1-10.
Omission: Statement does not mention a storage tank for bunkering fuel at Ediz Hook terminal as proposed by NTPC.

Sec. 1.4.
Deficiency: Indicate size of the bunkering facility, numbers, sizes and other data pertinent to the tugs, volumes of fuel consumed by tankers and all ancillary vessels and servicing needed for these. How is the bunker fuel heated? Energy consumed?

⑧ Page 2-157.
Deficiency: The severity of the electrical energy shortage by 1982 should be emphasized considering the needs of the oilport, 20 megawatts not now available.

⑨ Page 2-36.
Deficiency: Electric energy: the final EIS should include the 1978-79 winter peak which exceeded forecasts. Residents fear that in a power crunch the local industry would be curtailed as a result of pipeline need for electricity.

⑩ Page 2-36 (con't.)
Residents also expect domestic power rates to soar as a result of need to construct expensive new generating facilities. This is a public cost and should be mitigated by asking NTPC to pay for its power on an incremental cost basis, i.e., cost of generation of new power. What price will NTPC pay for power?

Sec. 1.4.
Deficiency: Please give the power requirements for a 1.283 million bpd throughout text and on Table 1.4.14.

Error: The DES gives power requirements in terms of a 933,000 barrel-per-day capacity: a letter to the Bureau of Land Management from Butler and Associates (5/12/78) outlines power requirements for 1.283 million barrel-per-day.

Deficiency: Annual energy requirements to move 1.2 million barrel-per-day (B/D) are 2 billion kilowatt hours (KWH). This electricity load is equivalent to serving 83,333 homes for an entire year. The magnitude of such power demand should be discussed in terms understandable to laymen.

⑪ Page 2-162.
Question: Will the presence of the NTPC have a negative impact on development of coal reserves where it crosses coal fields in North Dakota and other areas? Should this problem be addressed?

⑫ Page 2-156.
Limitation on the expansion of present industries or development of new industries, because of the lack of a dependable power supply, should be discussed thoroughly.

Sec. 1.4.
Omission: Booster pumps, electric: indicate electricty consumption for 10,000 H.P. motor.

⑬ Question: Tanker engines are not very efficient, with a considerable amount of energy lost by heat. What effect will this have on water quality and marine resources? Will the above effect Washington State Class A waters designation?

⑭ Page 3-46.
Deficiency: Is growth factor and increased need for P.U.D. power included in statement basis Clallam County will have enough power if Northern Tier project not built?

⑮ Page 5-9.
Question: What is the specific "potential regional power supply shortage" with Northern Tier in the harbor? What is its actual and real impact on existing industry power requirements? If a shortage of power does occur, will the local industries be required to shut down while Northern

Page 5-9 (con't.)
Tier would continue to operate? What impact would that have on the local economy? Would new industries be restricted from locating in the area because of power shortages?

⑯ Page 5-22.
Question: What would the Northern Tier proposal impact be on the regional economy's power supply and region's ability to attract new industry to Washington and surrounding states who receive power from BPA?

Table 1.4-28; Page 1-54.
Question: Crude delivered is over 1M B/D, with a power requirement of 37,872 MWH. The power requirement is not consistent with Table 6.3.4-3, page 6-9, which contains averages of 1 mil. MWH daily.

CONT

⑰ The BLM should include a net energy balance study in the evaluation. This is particularly important in light of increasing energy supply problems. Also, since the BLM now has several alternatives before it to supply the mid-west states, energy consumption rates of the various proposals would be a proper element of comparison.

Deficiency: Please present the basis and documentation for the conclusions reached. The net energy balance should also include the energy losses due to need for mitigating measures to offset pollution and energy losses due to reduction in food chain organisms from shrimp in Port Angeles harbor to plankton at sea where ballast water will probably be discharged. Include barging of fuel to tankers, which might be a long-haul proposition if it is brought up from California rather then from the inner Puget Sound refineries. All energy expenditures related to the project should be included in the net energy study. And it would seem proper that the alternatives section of the Environmental Statement include a net energy balance comparison between all the alternatives.

G

## ENGINEERING

Comment: Overview of engineering-related material from the BLM-DES and Washington State Site Application.

This type of material is generally called "Preliminary Engineering" from the technical standpoint. It is often put together by senior personnel, technical writers or young engineers; none of whom are particularly good at detailed analysis or innovative concepts. Therefore it is not surprising that nearly all of the material is very standard stuff. There are a great many generalities and few, if any, surprises, particularly in the way of new ideas. The primary purposes appear to be to demonstrate a general knowledge of pipeline principles and to touch all possible bases.

① The basic concept of using USCGS maps as the basis for a pipeline design is probably the only practical thing to do under these circumstances, but it is hardly adequate for anything but very rough routing, pump station location and design parameters. The mathematics (pressure loss, hoop stress and horsepower) are all quite standard and adequate for this work, but they did get a little mixed up on the hydrostatic test pressure. In one place they tie it to 90% of the yield strength of the pipe, which is essentially correct, but elsewhere they relate it to 125% of the operating design pressure, which is not a truly valid criterion.

② They seem to get into the most trouble worrying about control of engine and hydrocarbon emissions. This appears to have produced at least two questionable decisions: floating roof tanks and electric pump drivers. Floaters are a very risky choice, it would be very interesting to find out if anybody else has built floating roof tanks of this diameter and in a seismic area. The alternative is vapor recovery which is, of course, very expensive and imposes difficult tank design problems.

Electric motor drivers are seldom used with pumps of this size for several reasons. First of all, they run more expensive both in investment and operation. Secondly, they run at a constant speed - making it necessary to throttle the discharge of the pump station to control throughput. This is a direct waste of head and energy. Variable speed drivers, such as internal combustion engines, permit you to achieve precise flow control by varying the speed of the machine at no cost increase.

The construction procedures are also general but seem reasonable. The labor and equipment strength (except for the pipeline spreads) seem a bit unbalanced and inconsistent, with barely enough equipment in some places and too many laborers for the number of skilled workers in others. The worst construction decision is the one to use a consultant to manage the project. Only the owners have sufficient incentive and muscle to control avaricious contractors. The latter will quickly get the upper hand, resulting in overruns,confusion, delays and loss of inspection control. The consultant really has no incentive to control the project. His fee is not based upon efficiency and his only interest is in perpetuating his contract. Alyeska and WSPPS are good recent examples of the chaos which can result from this type of a buffer arrangement.

Some committee members believe that Port Angeles harbor is just too small for this operation. While not marine experts and possibly there will not be any storm or traffic problems, they can foresee problems. The decision to locate so much big equipment on offshore platforms is certainly unusual and is probably dictated by the lack of room on the existing spit. The logical thing to do would be to fill the inside of the spit to get more room, but permits for this might be very difficult to get, so they are ducking the issue. The location of such large items as meter banks, meter provers and surge tanks which don't need to be on the wharf is an expensive way to go and greatly increases the opportunities for marine contamination. Finally on this point, a fire and explosion, when the ship was almost empty say, would be a public disaster with the downtown area only a few hundred yards away.

③ Deficiency: There is not enough attention paid to spill prevention. The major effort appears to be on containment and collection. The surge tank will not solve all the problems. For example, quick disconnects on the loading arms are potential spillers; bunkering is always messy and is bound to be more so if its control remains without strong accountability.

④ Deficiency: The pile design for the wharf is handled very sketchily. There is usally some discussion of test pile programs, batter pile design, driving formula to be used, pile lengths, etc., but here it is barely mentioned toward the end of the A.S.C. This section needs more detail.

⑤ Deficiency: The use of tank mixers is unusual, probably unnecessary and inconsistent with their assumption of pipeline quality oil from the tankers, whatever that means. This section should be clarified.

⑥ Deficiency: BLM should include a much more thorough discussion of batching. Without considerably more development in the planning and design of operations, gravity discrimination must be questioned. For example, Minas Sumatra crude has almost exactly the same gravity as Alaskan crude, but has much more wax and much less sulfur.

CONT

⑦ Question: Is it legal to have dikes around only three sides of the tank farm? The holding basin concept should be further explained.

⑧ Deficiency: Although there appears nothing really wrong with their description of the mainline pipe to be used, the discussion should be expanded. Toughness, chemical composition, cold embrittlement and other qualities could be specified or at least indicated now, but they weren't. Why wasn't a little bit stronger pipe than X65 chosen? Actually API 5X165 is sort of a minimum standard for pipe these days.

⑨ Deficiency: Welding information is also inadequate. At least the general approach to welding engineering and specification, welder qualification and control, inspection procedures and similar matters could have been discussed. What percentage of welds would be X-rayed?

⑩ Deficiency: More information is needed on engineering and construction management. Nowhere is there a mention of a cost control program or personnel to man it. Schedule control is only mentioned in passing. There is much talk about this and that work being done by "contractors expert in this field" but nothing is said about how they will be selected or on what basis, fixed fee, cost plus, target estimate or what have you. One of the most important areas in project management has been skipped over. If they are so interested in proving their technical competence with hundreds of pages of "boilerplate," why aren't they equally anxious to demonstrate their management skills as well?

Deficiency: Noise suppression data must be expanded. There is no mention of encapsulating noisy equipment and the pump stations don't even seem to have buildings around the pumps. The discharge pressure control valves at the pump stations will frequently squeal loudly. Even with electric drivers, the pumps will exceed the 70 db limit stated in their material, mainly because the requirement is so absurdly low. Alyeska never solved this problem for all equipment and is probably operating in violation of some codes today. Alaskan and other pipeline experience should be commented upon in this section.

Comment: Overview of geotechnical information utilized by the Northern Tier Pipeline Company in applications before the BLM and Washington State Energy Facility Site Evaluation

Subject Report: Geotechnical Report on Investigations and Recommendations for Terminal Facilities

The soil investigations, laboratory analyses and recommendations were performed and reported by Shannon and Wilson (consultant) of Seattle for Swan and Wooster (engineer) of Seattle, the latter firm presumed to have been retained by Northern Tier to perform the detail engineering for the terminal facilities. In general, the report is considered to provide adequate coverage of the foundation media and recommendations required to proceed with final design. However, additional exploratory borings and soils work will be required during the engineering phase to more precisely define the soil properties in areas of final locations of structures, submarine pipelines and final design concepts should these vary from present thinking.

The investigations covered in the report consist of exploratory borings made in the proposed areas to be occupied by the fixed dock structures, the submarine pipeline and the tank farm at Green Point including pump station and other auxiliary structures and earthwork. Representative samples were taken from the borings, with N values being determined by standard penetration procedures as a measure of the density of the soils encountered and their resistance to pile penetration. Water content of the soils was determined and logged in depth. A number of grain size determinations from various borings at varying depths were also made, plotted and presented in the report. Samples from the dock area were analyzed to determine the resistance of the soils to lateral pile loads. The results of these investigations and recommendations, together with comments, are covered below for each of the three main areas of construction covered by the report.

In general, all soils encountered in the borings are noncohesive and granular in nature consisting of fine sands to gravel of moderate size. These soils extend in depth below pile tip elevations, no bedrock having been encountered in any of the borings. From Ediz Hook to a point about 1/3 the distance to Green Point, the soils near the surface are of recent origin and relatively loose as compared to the underlying material which are described as glacially overriden soils of greater age. These underlying soils are classed as dense and are exposed at the botton for some half the distance to Green Point as well as comprising practically all soils within the Green Point area.

### Dock Area

The looser surficial soils in the dock area vary in depth from shallow up to about 20 feet and will offer relatively little in the way of resistance to pile loading or to driving resistance. The consultant studied three sizes of open end pipe pile presumably being considered by the engineer for the various dock structures. The largest of 36 inch diameter is considered for those structures subject to heaviest loading, the separated breasting and mooring dolphins. The smaller sizes, 24 inch and 18 inch, are considered for the platform and walkway structures respectively. The design concept, apparently, for the heavy structures is to arrange the 36 inch piles in vertical and/or batter configuration and tied together at their tops with massive concrete caps, to resist vertical loads and those lateral loads incidental to berthing and mooring. A maximum design load of 500 tons was used in the report for the study of these piles. This is a credible loading considering the design concept and the recommendation of the consultant that, due to driving difficulties, a small batter of two in twelve should be considered.

The consultant analyzed, by means of the Wave Equation Theory, the required depth of penetration for all pile sizes to achieve the stated safe loadings. According to this, the 500 ton pile must be driven in the order of 50 feet into the dense soils underlying the looser material. To accomplish this, they recommend the use of a 300,000 foot pound hammer. This size hammer has not been around long and was undoubtedly developed for driving the anchor piles in offshore drilling platforms. A lighter hammer rated at 100,000 foot pounds is recommended for driving the smaller piles.

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A ground acceleration of 20% gravity is recommended for design of the dock structures for resistance to earthquake forces. This was based on a Modified Mercali intensity of VII which can be considered amply conservative for this area. Ground motion associated with an earthquake of this intensity could, conceivably, cause liquefaction of the loose surface soils in the area. Such an occurence would pose no threat to the dock structures; however, to prevent damage to the submarine pipeline, it is recommended to be laid at a depth in close proximity to the top of underlying dense soils in the vicinity of the Hook.

In considering the type of design and construction of facilities at the Hook, as implied by the report, only two adverse influences are seen, namely:

1. The use of a 300,000 foot pound hammer and the lighter one is bound to prove offensively noisesome to residents of the community over the period of time required to penetrate the dense strata and complete the driving work. Although jetting was specifically not recommended in the report, there are ways of mitigating the noise problem, e.g., preboring or controlled jetting inside the piles or, conceivably, an entirely different design approach. Either of these alternatives should, in the interest of cost savings alone, be studied by the engineer prior to establishing a firm and final design.

2. Considering the heavy floating equipment and construction activity in the dock areas, it would not seem possible for the public small boat launching ramp to remain useable at its present location during the construction phase. There is no valid reason why the public should be deprived of this facility and NTPC should come up with a statement on this matter.

Submarine Pipeline(s)

A number of borings were made along the proposed route of the pipelines from the docks to Green Point indicating that for most of the route the lines will require burying in the dense, glacially overridden soils. No recommendation is made as to what this depth should be except in the shoreline surf area at Green Point where they recommend rock backfill in the trench over the pipe and shoreline rip rap protection. Conservative side slopes are recommended for the cut in the Green Point bluff together with the means by which the cut should be backfilled and finished off after installation of the lines.

The only significant departure in the report from the NTPC statement is the latter's proposed means of excavating the submarine trench by jetting. For most of the route this does not appear feasible and, as the report points out, the dense bottom soils will require excavating by clamshell.

Tank Farm

The report confirms that all of Green Point is composed of dense granular soils in depth and provides excellent foundation media for the storage tanks and other facilities. Loads imposed by the 54 foot high tanks can be carried by the soils with a high factor of safety. Tank settlements of a few inches are predicted and, due to the granular nature of the soils, would occur as loading is applied. There is sufficient fine material in the soils to create wet weather handling problems especially in construction of the tank pads which are recommended to be compacted to 95% relative density. Concrete tank ring walls are envisaged for all of the oil storage tanks. Conservative recommendations are made for compaction and side slopes of the tank retaining dykes. Planting is recommended for cut or manufactured slopes as protection against erosion. Design soil bearing values are given for auxiliary structures. e.g., the pump station.

Summary and Conclusions

The geotechnical report is, for design and construction purposes, fairly comprehensive and definitive, although some additional exploratory and engineering work will undoubtedly be required in specific areas if final design proceeds. The recommendations made are, in general, conservative. Soils in all areas are non-cohesive and considered to provide an excellent foundation media, although for the dock structures, their potential at this point in time do not appear to have been fully considered by the engineer.

Emergency Generator
Deficiency: Emergency generator location easily accesible to berth operation.

Deficiency: Should also have capability for starting manually if auto fails.

Deficiency: Also located where best protected from adverse weather conditons or mechanical damage.

Question: If emergency generation fails to take-over on power failure, what happens?

Question: What time delay can be expected for take-over of emergency generators?

Controls and Berthing; Page 1-9.
Deficiency: Tanker berthing dock operator should be able to stop booster pumps immediately. Not wait for control system to be activated from on shore storage facilities. Emergency stop controls should be located at all service platforms and pump platforms.

Storage Support Facility; Page 1-15.
Mitigation: Considering the concern expressed in the statement for visual impact on the environment, it should be established that this tank will be aesthetically pleasing, as elevated tanks go, e.g.,spherical or torospherical type.

Onshore Storage Construction; Page 1-41.
Mitigation: Paragraph six on this page covers hydrostatic testing of tanks. In consideration of possible adverse impacts on local water supplies, test water should be reused for as many tanks as feasible.

Tanker Unloading Facility; Page 1-7.
Deficiency: The description of the fixed berthing and mooring structures should contain, at the least, a brief statement covering the design basis for these structures. To cover this elsewhere in the statement by reference to governing codes of practice, regulatory provisions, etc., ie, in the absence of any codes or regulations governing marine

CONT

structures of this type, insufficient for these critical structures. Without getting into "highly technical" discussion, the statement should have established that these structures will be designed and constructed to resist safely certain spelled out forces in accordance with the most current state-of-the-art.

⑪ Onshore Storage Facility; Page 1-14.
Question: Fifth paragraph on page 1-14 states that spillage of oil from storage tanks would be controlled by low dikes surrounding groups of tanks and remote holding or impounding basins. Is it standard procedure in the industry to provide only one dike for eleven tanks of the proposed size? If one tank in this group is ruptured and a fire ensues, or vice versa, what is the vulnerability of adjacent tanks with due regard for the fire protection system proposed?

General Comment
Omission: The criteria and the document indirectly mention safeguards due to failure of any of the operations or systems.

Omission: The main thrust is environmental impact without explaining or requiring specific statements on the effect of failure of the communication and control system.

Omission: The data presented is voluminous but there is not summary for safety (protection of people and the environment).

Omission: It is unclear how a feasibility determination could be made from the data presented with respect to fail-safe operation.

Purpose of Proposed Action; Page 1 thru 63.
Deficiency: Insufficient detail to assess the reliability or impact of communication system failure including controls.

Environment and Product; Page 6-10.
Deficiency: No mention made of effect on fishing, log booms bottom disturbance from tanker propellers, access to boat launching ramp, etc.

⑫ Pipeline Supply Map; Fig. 1.
Deficiency: Map does not show all pipelines in place that could serve area.

⑬ Sec. 1.4; Page 1-50.
Deficiency: The ES states "terminating operations would lead toward abandonment and possible disposal of all or portions of the entire system." The word "possible" in that statement is too vague. If operations are terminated the system should be disposed of as directed by some appropriate authority. Additional information is required to permit the general public to know what will happen if and when operations are terminated.

⑭ Page 3-37.
Deficiency: Does not address economic and hazard impacts relating to leaving submarine pipelines hanging on Green Point Cliff. "If" is not a procedure description.

⑮ Page 3-39.
Deficiency: Impacts from unspecified abandonment responsibility would result in greater than nuisance impacts for city and county. BLM should address this probability.

Deficiency: Please discuss whether any financial arrangements such as a bond are contemplated to assure that costs of proper final disposal can be met without public burden. It seems that if there is insufficient crude oil or other economic difficulties the pipeline might well go bankrupt and unable to take care of that disposal properly.

⑯ Page 3-55.
Deficiency: Specific abandonment procedures and responsibilities of applicant not spoken to.

⑰ Page 3-14.
Deficiency: What preventative measure during abandonment would be taken to prevent sedimentation in Seibert's Creek?

Page 1-14.
Deficiency: Paragraph 11, 2nd sentence states: "The filtering and coalescing stage may be bypassed when no oil is present." It is believed the bypass capability should be eliminated, one more chance of human error would be removed.

⑱ Page 1-29.
Question: Figure 1.4-4: Should heliport be relocated to an area between strainers, the control building and fence? Having the heliport in a corner creates the risk of the helicopter rotor contacting the fence and possibly causing the aircraft to crash. It is not uncommon for aircraft crashes to result in fire. Having the heliport in a more open area will reduce the possibility of a crash.

⑲ Question: Figure 1.4-4: Some objects in the drawing are unidentified and some are obvious. Two things near the fence between the surge tank dike and the remainder of the pump station have the same physical characteristics as the valves, but they are not identified. What are they?

⑳ Page 1-30.
Question: Figure 1.4-5: Should heliport be relocated to a more open area between the strainers, control building and fence? (See item 1.4-4 above for rationale.)

㉑ Question: Figure 2.4-5: Two objects near the fence about in line with the manifold system between the surge tank dike and the rest of the pressure reducing station are not identified. What are they?

㉒ Page 1-33, 1-34, 1-36.
Question: Figure 1.4-6, 1.4-7, 1.4-8: It appears that the dike has openings on two sides. Is there an opening on two sides or is the figure drawn that way because it cannot be done to scale and get it on the page?

㉓ Page 1-50.
Question: Paragraph 7: What would be the qualifications of the individual making the certification?

㉔ Question: Paragraph 8 states in part: "All oil in the piping and valves within the tank farm would be drained and transported to another operating system in the area." There are no other systems in the area. Where would it be taken or how would disposal be accomplished?

㉕ Question: Paragraph 8 last sentence: Since oil and water are immiscible, how free of residual oil will the system be?

CONT

㉖ Question: Paragraph 9: What qualifications will the person doing the certification have?

㉗ Question: Paragraph 10: What would the inhibitor be? Might it be hazardous or cause environmental degradation?

㉘ Sec. 1.4.
Deficiency: What is the magnitude of induced voltage that could exist in a multiple use pipeline corridor? What are the effects, if any, on the pipe wall, on soil organisms, on burrowing animals, on plants and on wildlife from such currents? Is the build up sufficient to cause a shock to man or animals? To have a heating effect? To interefere with radio or television reception? What are the effects of the cathodic system to plants, soil organisms, burrowing animals, wildlife and man from the cathodic pipe protection system?

㉙ Deficiency: Pipeline system: Note ultimate capacity of 1.283 million bpd. What width of pipeline right-of-way? Which side of BPA right-of-way across Clallam County?

㉚ Deficiency: Pipeline: What stresses in pound/square inch are present in the normally operating filled pipeline at the peak impulse of pumping at the bottom of the longest decline in the entire system (1500+ miles)? What will the stresses be at maximum from temperature effects of extreme weather? From ground settlement? From seismic shifts? What kind of pressures are encountered from avalanches in mountain passes? From landslides?

㉛ Sec. 1.4 (con't.)
Deficiency: Describe rusting and corrosion of the grade of steel to be used in terms of corrosiveness of soils to be traversed and in terms of corrosiveness of types of oil to be carried, interpreting these so one can tell about how long it will be before the first corrosion leak occurs, and so that it is possible to know how long the pipe can carry the stresses mentioned previously.

㉜ Deficiency: Will welds be X-rayed? How are records kept and how are they monitored? Will there be publicly available results of such testing?

㉝ Deficiency: Why is not double walled piping required for all river and stream crossings with an alarm system to detect breach of the outer pipe wall? How is pipe protected when it cannot be buried below the scour depth of a stream or river? Which streams and rivers are affected by this condition? Where are the references and background data for scour depths of all rivers and streams to be crossed? This should be included in a Technical Addendum. When a stream is not named, as Eagle Creek or Jorstad Creek, in your list of streams and river crossings, does that imply no special pipe will be used in those places? If so, the EIS should include the downstream outflow points of such streams as areas especially at risk and point these up under environmental costs with a relatively high cost factor.

㉞ Deficiency: Major estuaries are fed by such streams and many of the river crossed and are tremendously valuable for food production. There is no substitute area on the Pacific Coast for Dabob Bay to raise oyster seed. Should it become oil-fouled, the economic and environmental damages would be very high. Economic impact assessments should be made of areas such as this (e.g., Sequim Bay, Dungeness Bay, Discovery Bay, etc.).

㉟ Deficiency: Describe the standards for hydrostatic testing of pipes and relate this to amount of oil leakage that would be tolerated under these standards. What is the operating reliability of the electronic controls (historic data)? What is the historic operating reliability of human performance at control stations and tank farms? What proportion of spills have been due to the human factor?

㊱ Deficiency: The quality of pipe metal used should contain a description of its ability to withstand oxidation in fresh and saltwater environments and its resistance to corrosion from within. What is the expected time before the smallest leak can be expected? When can we expect significant deterioration in the various environments and what is the half-life of such pipeline in these environments? (Presumably the weakest link would determine this.) Does cathodic protection work in the vicinity of other installations which are grounded or which carry electricity?

㊲ Sec. 1.4 (con't.)
Deficiency: This pipeline will, in places, be crossing marshy ground. What special provisions are planned to reduce settlement and resulting strain on the pipe walls and what is the design criteria for amount of settlement in the soft spots and permissible pipe deformity between hard and soft spots?

㊳ Page 140.
Deficiency: Explain how welds can be inspected and tested for the lay-barge method of construction and any imperfections corrected in timely (before pipe is oil filled) fashion. What provision is made for oversight of crews? Can pipe be retrieved if it has a faulty weld and is laid underwater?

㊴ Sec. 1.4.
Deficiency: In pressure testing segments of pipe with water, what measurements are made, with what instrumentation and what criteria are applied? Is any pressure drop over a 24 hour period acceptable? Is this test made before or after pipe is covered with dirt in the trench? If done after, how can a leak be found and fixed?

Omission: What is the reliability of densitometers? Discuss the probability that oil from a common source might occur in successive batches and the probability rate for a situation in which the control center is not alerted to dispatch oil from a tanker.

㊵ Question: What size seismic event would be tolerated by these 285 ft. X 56 ft. high tanks? By the juncture of the subterranean pipes with fixed facilities at the berths and on land? Along both subterranean pipes and on land pipes? What is the historic record for seismic failures in those various categories?

㊶ Omission: Construction schedule: How is this to be modified by changing plans of NTPC? With major revisions in plans as for an underwater crossing of Puget Sound, large parts of the EIS will have to be revised. Table 1.4.17 would need complete revision for Washington State.

CONT

㊷ Page 3-50.
Deficiency: Does not define specific scope of Phase II construction at onshore storage. Maximum number of tanks to be added whether or not third berth installation accompanies same.

㊸ Page 1-8.
Deficiency: Three submarine pipelines and three berths should be acknowledged and evaluated as a reasonable, foreseeable part of the NTPC proposal.

㊹ Deficiency: The need to give background data supporting scour depth of streams has been mentioned.

Sec. 2.1.2.6-2.
Deficiency: Characteristics of major river crossings 2.1.2.6-2: Please give references to source material. Where can we see the description of how these values were obtained and assess the adequacy of the underlying studies? The only source quoted is NTPC.

㊺ Sec. 1.4.
Deficiency: In erosion control, what criteria will be used to determine whether ditch lining and ditch checks are necessary? In laying the line, describe the process for going through rock and give the relationship of blasting areas to distance to residences.

㊻ Deficiency: The BLM-Des implies that mechanical failure safety hazards are to be considered negligible because of both the isolation of project components and the design measures incorporated into the system. Mechanical failure impacts are not adequately discussed.

㊼ Question: ,What is the historic record of human failure with regard to pipeline storage facility malfunctions?

㊽ Question: Is the spacing of the storage tanks at the proposed tank farm adequate for safety? Reportedly, the Elk Hills Reserve has spaced tanks at 1-1/2 diameter, considerably more than NTPC.

H

FIRE PROTECTION

Note: Several comments related to the issue of Fire Protection are discussed in the "Emergency Services" section of this report, and briefly in the "Medical" and "Oil Spill" sections.

Comment: Fire Protection is an area that worried many citizens of Port Angeles and Clallam County primarily because of the large tankers that are being considered for use in Port Angeles. Because of the great hazard involved, fire protection requires much more extensive treatment than is given in the D.E.S. No attention is given to a ship that might catch fire while waiting to unload or what might happen if a burning ship floated away from the dock where the fire-fighting equipment is located. Specialized equipment stationed in Seattle would be of little or no value since steaming time from Seattle would be at least five to seven hours away. NTPC statements and the BLM-DES have yet to provide for adequate fire protection equipment. In the event the pipeline is constructed and eventually expands to three berths, then the possibility of manning additional fireboats and other additional facilities should also be considered.

In the long run the continued growth in the eastern and western portions of Port Angeles will surpass the ability of a single fire station with fifteen paid personnel and twenty-four volunteers to furnish adequate fire protection to Port Angeles. However, if Port Angeles is subjected to an influx of 500 to 1,000 construction workers, then it will simply overwhelm our fire protection capabilities. Within the past few years the City has been gradually upgrading the equipment, but in no way would they be capable of absorbing this type of growth within their present configuration. The geography of Port Angeles also contributes significantly to the ability of the department to offer fire protection to the community. Port Angeles is laid out in an East-West direction and is bisected by four canyons or ravines which create difficulties in going from one part of the community to another.

① Deficiency: The tank farm area is of great importance to proposed fire protection. It has many areas to be dealt with, but with the information provided, comments cannot be made. Local fire protection officials need more details before meaningful analysis can be conducted.

Deficiency and Omission: Fire protection is mentioned only in a general way in a very few short paragraphs. No assessment of impacts by fire or explosion are discussed at all. A few sentence superficial review of some of the fire protection facilities to be provided by NTPC is given but there is not enough information given to even attempt to assess the magnitude of the problem or the adequacy of the fire protection that may be provided.

Due to the limited fire fighting capabilities available in our area only tankers with segregated ballast and tank inert gas systems should be allowed in our port. A statement to this effect should be contained in all proposals relating to an oil port in Port Angeles.

Page 1-8; 1-10.
Deficiency, Omission and Error: Location shown on drawings of the diesel driven fire pumps near the booster pump platform is unsatisfactory as it is too exposed to damage in case of fire or explosion. Pumps should be located ashore in pits or other protected locations as close to water level as possible. Two separate pump locations are necessary with separate suctions, controls and valves so either pump may operate independently of the other. Suction inlets and their maintenance in salt water present a special problem and must be carefully designed. Necessary pump capacity has not been discussed or detailed disruptions or locations of hydrants, fire mains, fire fighting, chemical storage and locations and number of necessary fire appliances given.

Page 1-10.
Deficiency and Omission: Tugs and line handling launches supplied by private service companies should be required to have auxiliary fire pumps and monitors with foam capability at capacities to be designated by the Port Angeles Fire Department.

The fully equipped fire boats should be moored at a secure location away from the unloading pier yet readily available. The size, pumping capacity, foam capacity, manning level and other equipment is not specified but it should be as specified by the Port Angeles Fire Department or its consultants.

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Page 1-15.
Comment: Due to the distance these storage facilities are from the City of Port Angeles it is doubtful the Port Angeles Fire Department would take part in developing firefighting procedures or detailed design as stated in the BLM document.

The Clallam County Fire Marshal and Building Department along with the appropriate Rural Fire Protection Districts would have responsiblity in this area. These local government officals have not been provided with enough details regarding fire protection plans to make a meaningful analysis.

② Page 2-44.
Error: The statement that the Port Angeles Fire Department has four standard pumper trucks and a pumper-ladder truck is in error.

In fact we have two standard pumper trucks and a pumper ladder truck in service with one 25-year old pumper truck with limited equipment in reserve.

③ Page 1-16.
Deficiency: The fire fighting road system is not adequately addressed. One access road and partly on the dikes.

Page 2-44.
Deficiency: Water limitations and manpower needs are not addressed adequately. See: Coast Guard report on Long Beach explosion/fire, P.14. (Report 16732/71895): "Altogether the Los Angeles Fire Dept. utilized 10 task forces, seven single engine companies, 5 foam apparatus, 5 fire boats, 9 rescue ambulances, 2 helicopters, 2 tankers, 2 light utility units, and various misc. equipment. Five task forces and two single engine companies were held in reserve. Some 240 uniformed fire-fighting personnel were actively engaged in the operation." (Note: This does not include Coast Guard equipment—which other sections of the Report discuss).

④ Deficiency: The DES does not address the explosion or major fire concept adequately. No plan or method of warning is included. Section 2-44 is concerned with the fact that in-fire protection is the just major emergency problem with the lack of manpower, equipment and time, all three being potential elements for a disaster. The second major problem would be the evacuation of areas from the lower section of the city and the areas along the bluff. Any explosion in the harbor will produce a shock wave which would have no resistance over water with the full effect along the shoreline into the central area. The Coast Guard Report, 16732/71895 notes that minor damage extends 3 to 6 miles from the explosion with the shock wave traveling overland. The 200 ft. height of the bluff would have very little deterioration power of the wave and might reinforce it due to energy uplift from the surface front. A shock wave from Ediz Hook would extend into the atmosphere as far as it would extend in all directions from the center of the explosion. Therefore a shock wave reaching the shoreline would be high enough to damage the structures on the bluff including the Olympic Memorial Hospital and possibly cause the chlorine at ITT-Rayonier to rupture.

⑤ Sec. 1.4.
Omission: What size fire can be handled by the equipment described? What would be the likely extent of the damages for a fire outside the ability of local equipment to control it, considering the long steaming time for equipment coming here from the Seattle area? What will happen to fire insurance rates for industries sharing the harbor? For residences in the vicinity? Has proponent committed to paying the increased premiums?

Sec. 1.4.
Deficiency: What is the volume held by the water tank? What is the distance between and water voulume capability of hydrants? What is the placement interval and capacity for foam chambers on top of tanks? How effective have these proved in actual use? How many portable dry chemical units and what size? Any insulated fire-fighting suits available? How many? How large a fire truck with what capabilities? How well trained a crew? Are foam trailers provided? If so, how many and what capacity? Describe the manpower available and equipment available from off-site firefighting sources: (a) within 30 minutes, (b) within 1 hour, and (c) within 2 hours of an emergency call.

⑥ Paragraph 1; Table 5.1.15-1; Page 5-12.
Deficiency, Omission and Question: Where would the timely receipt of assistance arrive from in case of a major fire? Trained or volunteers? The comments relative to local firemen and fire districts in this draft are very rudimentary and give very little insight into their ability to cope with major impacts of this nature.

⑦ Paragraph 4; Page 3-54.
Deficiency: Fire, Protection data currently unavailable. Why?

Deficiency: What is the basis for assumption one fireboat for the harbor and one fire truck for onshore storage with 25 tanks would be adequate protection? Information needed for operation phase related to water supply, water storage, insurance rates, and trained personnel. Location of all equipment.

Deficiency: Does not speak to increased firefighting risks associated with third berth installation.

Deficiency: Does not discuss traffic congestion and emergency evacuation procedures related to total harbor area related to hundreds of workers in area daily and inadequate street and road access to Ediz Hook area?

Deficiency: What protection would be provided for city and county residents from fire during abandonment?

Deficiency: Does not discuss fire safety and firefighting equipment requirements and personnel relating to Northern Tier project responsibilites. Does not discuss economic impact on community taxpayers.

Deficiency: How would necessary quantities of water for firefighting be provided and at whose expense? How much water would be required to fight a catastrophic fire and/or explosion?

Deficiency: Does not discuss current water line to Ediz Hook in terms of water available and current water total usage by existing harbor users.

Deficiency: Does not discuss method, equipment or water supply for onshore storage firefighting. What is water source? How much water would be required? How much would be stored? How would additional water beyond storage capacity be obtained, from what source and at what pumping rate?

CONT

⑦ Deficiency: What effect would NorthernTier project have on insurance rates for residents and businesses in onshore and harbor areas?

⑧ Comment: Are local tug boat crews and equipment available and authorized by their owners for firefighting in the event of major catatrosphic fire or explosion. Are the crews insured and trained for this specific duty not related to their work scope. Basis for assumption that Coast Guard is available and responsible for fire fighting.

⑨ Page 1-10.
Comment: Would Northern Tier provide manpower for the Fire Boat or would local fire services be expected to provide trained personnel?

Page 1-15.
Comment: Provisions should be made to keep the capacity of one tank available in one or more tanks at the on shore facility. If a tank were to become involved in a fire the crude could be pumped into the ullage reducing the amount of crude involved and would reduce the chance of oil froth being generated. Oil froth could be more disastrous than a fire.

Page 1-14.
Comment: A fire protection system status display panel should be provided.

Page 1-15.
Comment: Regarding the utility fire truck, who would be responsible for housing, manning and maintaining the vehicle, the Fire District or Northern Tier?

Page 1-15.
Comment: Paragraph 8 states: "Firefighting procedures and the detailed design of the fire protection system would be developed in cooperation with the Port Angeles Fire Department....." The onshore facility is to be located in Clallam County Fire Protection District #3, not Port Angeles. Firefighting operations are the responsibilty of District #3. Fire prevention is the responsibility of the Clallam County Fire Marshall. A statement should be added to read essentially: Fire protection and fire fighting procedures will be developed in cooperation with the Clallam County Fire Marshall and the Commissioners of Fire Protection District #3 through the District Chief and the Port Angeles Fire Chief. The County Department of Emergency Services will be consulted to insure contingency plans are developed.

Page 1-54.
Comment: Clallam County Department of Emergency Services and Clallam County Fire Protection District #3 should be included in the development of contingency plans for Clallam County facilities.

Page 1-56.
Comment: The manning of the fire boat is discussed previously. Will NTPC provide manpower for the fire truck or will Clallam County Fire Protection District #3?

Page 2-44.
Comment: As it relates to Fire Protection District #3 should read: Fire Protection District #3 which serves the Green Point area encompasses over 164 square miles. It has a full time paid chief and 80 volunteers. There are five fire stations, 6 pumpers, 3 water tankers, 2 aid cars and a chief's vehicle. It is rated 8 by the Washington Surveying and Rating Bureau. (The scale used is 1 to 10 with 10 being the lowest level of protection.)

Page 2-44.
Error: Paragraph 3 is not accurate. Sequim has one pumper, one pumper belongs to Fire Protection District #3 and is housed in the Sequim Fire Department. It is used by the Sequim Department to respond to fires in Sequim and in part of Fire Protection District #3 immediately around Sequim.

Page 5-12; Table 5.1.15-1.
Comment: Unavoidable impacts. Fire protection during operations. In addition to straining local departments, residents in the Green Point area would be greatly inconvienced by fire fighting activitiess, spectators, news media and from the smoke and possibly oil froth. Residents with shore property that permits a view of the Green Point area would undoubtably be bothered by the press and television news people seeking spectacular photo coverage of any major fire or explosion.

## FISHERIES

I

① Sec. 3.1.7; Page 3-32.
Omission: Fish - statement is assumptive, vague, and in error. Salmon are most vulnerable to oil on the water when emerging from spawning areas or during their early life stages in shallow inshore waters. Because they live and feed in the upper (<30 feet) layers of oceanic/marine waters, adult salmon could be adversely affected by the oil (SOHIO; 3-386).

② Sec. 3.1.7; Page 3-32.
Deficiency: Fish - statement does not detail the effects a spill would have on a river system which has a deltaic salt marsh zone. The Dungeness River is an example. Salt marshes are highly vulnerable to a physical impact from a spill (Table 3.1.7-7) and would be adversely affected.

③ Sec. 3.1.7; Page 3-28.
Deficiency: Community impacts - "Effects vary so much that it is difficult, if not almost impossible, to give a general discussion of such impacts . . ." SOHIO Impact Statement quantified the same type of information into our economic analysis for fisheries impacts. This statement (BLM) should provide same.

④ Sec. 3.1.7; Page 3-32.
Error: "Oil-spill effects on ocean dwelling eggs and larvae would be relatively minor." The eggs and larvae have no mobility and could not avoid a spill. They would be severely impacted, particularly if they are within 30 feet of the surface. The ultimate effect would be suffocation or lethal toxicity.

Sec. 3.2.6; Page 3-72.
Question: Biological components/Summary (2nd paragraph) If the spawning runs are reduced for several cycles, what is the time span? A spawning cycle (life cycle) for many salmonids is 3-5 years. Several cycles, as stated in text, could imply 15-20 years. This is significant.

CONT

⑤ Sec. 3.2.6; Page 3-72.
Question: Biological components (4th paragraph) What would be the effect of a spill on a river system in relation to ambient temperature variations. Oil, being somewhat of a black body, would be expected to exert an increased temperature. Statement should acknowledge and clarify.

⑥ Sec. 3.1.15; Page 3-50.
Deficiency: Operation phase (4th paragraph) "Some cleanup costs would be incurred . . ." Real dollar values have more meaning! Quantification is desired: loss to fishery, to gear, and to boats.

Sec. 3.1.15; Page 3-50.
Question: Operation phase (4th paragraph) If salmon and "other fish" avoid a spill, how could their flesh be tainted? Is "avoidance" an assumed condition?

⑦ Sec. 5.1.7; Page 5-6.
Question: "A chance encounter by phytoplankton and zooplankton . . ." What exactly is a "chance" encounter? No degree of probability is offered.

⑧ Sec. 5.2.6; Page 5-16.
Deficiency: Twenty years for recovery of salmon populations effectively kills a fishery for that system. How does this translate into an economic loss to the fishery? Specifics for the primary systems should be required.

⑨ Sec. 5.1.6; Page 5-5.
Question: Is there the possibility of oil run-off into Seibert Creek during a heavy rain storm (50 year storm intensity)?

⑩ Sec. 5.1.7; Page 5-5.
Question: Paragraph states that "strategic booming" off of Green Point could contain a spill and implies that conditions in the harbor are equitable with conditions off of Green Point. This is misleading. Green Point is subject to intensive oceanographic conditions while the protected harbor is not. Is booming an effective oil containment method for an area which regularly is subject to large waves and swells.

Sec. 3.2.6; Page 3-78.
Deficiency: Oil spill in a river system could effect a significant impact on a year-class of salmon. This would ultimately be realized by the ocean sport, commercial, and Indian fishery. Timing of spill also would be an important factor.

⑪ Sec. 4.6; Page 4-3.
Question: Would diversion of the river increase flow velocities, increase suspended sediment and turbidity? Could this also effect the biological systems and impose additional stresses? Would it alter the flow patterns of the river to such a degree that additional flood hazards would be evidenced?

⑫ Sec. 2.1.1.7; Page 2-22.
Deficiency: Paragraph 1 states that "some commercial and sport fishery are found in the west strait, but not to the extent found in the east strait." This statement is contradictory. The majority of the sports fishing resorts are west of the Lyre River and one of the most significant Indian fisheries (Makah) is located in the west Strait. The importance of the Strait fisheries should be presented as an aggregate and not as a segregated unit.

⑬ Sec. 3.1.6; Page 3-26
Deficiency: Destruction of eel-grass beds. According to the text, the eel-grass beds within Port Angeles harbor may reestablish "by the next growing season." The construction phase, however may overlap from one season to the other. Additionally, the next growing season implies that the biological community dependent upon the eel-grass beds would begin reestablishment within a year. This is erroneous. The biological community would experience an oscillatory phase of recovery over several years. If additional stresses are imposed (i.e. oil spillage), the community could be erradicated.

⑭ Sec. 3.1.6; Page 3-14.
Omission: Construction phase (1st paragraph, last sentence) If "overland flow" reaches Seibert Creek, what impact would it have on the biological communities in this aquatic system?

⑮ Sec. 3.1.7; Page 3-15.
Omission: Summary - entire section. Translate impacts from estimated spill frequency on marine resources into an economic evaluation (e.g. economic losses). Such should be within the framework of data presented in the SOHIO Impact Statement for the Long Beach Terminal proposal.

⑯ Sec. 3.1.7; Page 3-26.
Deficiency: Construction phase (1st paragraph). Tidal organisms may establish new communities, provided that low level oil spillage from operations would not stress these organisms. No information is provided in this respect.

⑰ Sec. 3.1.7; Page 3-26.
Omission: Operational phase - No economic analysis is provided for fisheries impacts. This information should be provided.

⑱ Sec. 3.2.6; Page 3-75.
Deficiency: Biological components - construction phase (6th paragraph). The Dungeness River's high sediment load is attributable to its source region characteristics. Increased sediment values over its natural ambient levels could possibly stress indigenous fish species within the river system.

⑲ Sec. 3.2.6; Page 3-75.
Error: Biological components - construction phase (paragraph 11). The Dungeness is a cold water system. Statement in paragraph 11 states that cold water fishes would be impacted by higher sediment loads than warm water fish. This contradicts the statement in paragraph 6, about the Dungeness River, etc.

⑳ Sec. 1.2; Page 1-1.
Question: What are the potential explorations and exploitations for and of oil and associated resources, and the likelyhood of that activity, in the region from the central Washington coast to central Vancouver Island ocean coast, seaward and landward, that would be encouraged by increased economic attractiveness and convenience of the Port Angeles oilport proposal acceptance?

㉑ Table 1.4-9; Page 1-56 (para. 7).
Omission: Project would cross Dungeness irrigation project.
Mitigation: Major river crossings might include sealed casing. Effectiveness - provide secondary protection against water network contamination. Require critical (as defined by concerned local agencies) waterway crossing pl ssing be heard individually and specifically in detail by appropriate agency(s) prior to issuance of overall proposal approval. Effectiveness-insures acceptibility of planning on case by case base, on each cases merit, negating problem solving(?) in the biased atmosphere of overall project approval "and consequent loss of status for concerned arguments (environmental sensitivity)."

CONT

Sec. 1.4; Page 1-56.
Question: As construction may be required to recognize temporal environmental sensitivity, is it possible to preplan potentially necessary repair work in recognition of constraint continuity? Can we devise a hypothetical situation for discussion? Are there any alternatives between a 10 month shutdown of the line and maximum environemntal impact?

㉒ Sec. 1.4; Page 1-58 (#25).
Question: Does this mean we will have help to increase tax revenue demand (by extension: increase taxes) to cover the troubles we don't want anyway?

Abandonment - is an abandonment/cleanup bonding component appropriate? Who pays in event of bankruptcy?

㉓ Sec. 2.1.1.7; Page 2-14.
Question: Are U. S. Coast Guard direct observations of ranges for wind strength and wave height and period available?

Sec. 2.1.1.7-2; Page 2-17.
Deficiency: Life of project forecast appropriate, as opposed to 5 year listed.

㉔ Sec. 2.1.1.7; Page 2-22.
Error: Green Point is a locally well known whale wintering ground. Whale populations are apparently expanding in numbers and by extension, area. Area use may well increase, though dependent on unexamined variables. Local memory (Indian tribes) may provide clues to post area usage and perhaps future distribution. Example: Both Quileute and Ozette River mouths were major aboriginal whaling sights because whales could be (and are) found as close in as the surf line. The Clallam Tribe took whales in the Straits, specifically offshore from Port Angeles spit.

㉕ Table 2.1.2.6-4; Page 2-60.
Error: Dungeness River specific conductance: listed mean outside listed range; Dosewallips River same.

㉖ Table 2.1.2.6-18; Page 2-81.
Omission: The following are legally defined as Lower Elwha Klallam Band usual and accustomed fishing area: Siebert Creek, Dungeness River, Jimmy Come Lately Creek, Salmon Creek, Snow Creek, Little Quilcene River, Big Quilicene River, Dosewallips River, Duckabush River, and Hamma Hamma River.

Fig. 2.1.2.6-2; Page 2-83, etc.
Mitigation: River crossings require low flow, and must occur at times of minimum juvenile and adult salmonid usage, probably early August. (Point also made by K. Gilliam, Elwha Hatchery manager). Effectiveness - minimize salmonid disruption. (Specifics should be case by case local concern determination)

㉗ Sec. 2.2.1.2; Page 2-154.
Question: Should future air quality trends be projected with the addition of a tourism traffic function?

㉘ Sec. 2.2.1.7; Page 2-155.
Deficiency: Oysters have been grown in Port Angeles Harbor (Peninsula College; 1970, 1971). Significant salmon potential exists in streams entering Port Angeles Harbor, planning is on going.

㉙ Sec. 3.1.7; Page 3-32.
Question: BLM should note the extent to which a river spill would produce avoidance behavior in up or down stream slamonid migrants? BLM should estimate the time this behavior might contribute to significant production decrease? (Paranoid speculation: Abortion or straying of major parts of spawning runs; residualization of out migrants with resultant competition/predation effects on 1 and possibly 2 succeeding brood years.) Do we know, or can we speculate on, the effects on redd site selection given the potential of silt/oil combination deposition?

Table 3.2.6.1; Page 3-68.
Mitigation: Take core samples of river crossings to proposed depth. Effectiveness - refinement of superficially examined composition statements; produce accurate estimates of sediment increase.

㉚ Table 3.2.5-4; Page 3-74.
Mitigation: See comments on table 2.1.2.6-18 (above). Note 5/ add "stray or delay." River spills will probably induce immediate fishing closures (consequent lost fishing time, income) which will last at least until effects are assessed. Mitigation should include preplanning and agreement for fishermen loss compensation. Effectiveness - continuance of community harmony and income.

Sec. 3.2.6; Page 3-75.
Deficiency: Sediment redistribution through spawning is noted. Spawning is keyed to upwelling percolation of water through substrate. If percolation is inhibited spawning activity may be redistributed and the ground lost, subject to on going clogging of intercises. The end result is a compacted situation relatively unproductive.

㉛ Paragraph 1,6,7; Page 3-78.
Question: Could the list of oil effects on freshwater organisms include behavior change in fish? Change in predation/competition dynamics in one year class component loss? Estimates of regulation change necessary to pass spawners through fisheries? Paragraph 1 - Add 5 and 6 years for some chinooks, potential for dominant year/age class change.

㉜ Sec. 7.11; Page 7-5.
Question: Does acceptance of this proposal mean the difference between adding a hydropower dam in Clallam County (or region) or not?

㉝ Page 4-6 and 4-8.
Deficiency: The boat launching facility on Ediz Hook has not been adequately dealt with. There are no areas elsewhere in the harbor that have enough room to handle the amount of boatmen that utilize this ramp, particularly in the months of June through September. Furthermore, there are occasional summer storms from the northwest that pose a great danger to small craft that would have to cross the harbor. At present these craft can make their way to safety by proceeding in the lee of Ediz Hook.

㉞ Page 4-3.
Comment: Local fishermen with considerable experience with wind and wave conditions in Port Angeles Harbor and the Straits find the provisions outlined for containing and cleaning up

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㉞ spilled oil to be "ridiculous". It is quite common both in the harbor and outside for large logs to jump their containing boomsticks because of wave and chop action. To expect oil booms to contain oil under anything but optimal conditions is ludicrous.

㉟ Sec. 2.1.1.9; Page 2-26.
Deficiency: Several local sportsmen disagree strongly with the premise expressed that only endangered species or areas of special concern be addressed here. Many animals frequent the beaches at low-tide including deer, otter, raccoon, coyote. Even minor chronic spills could result in these animals being impacted by ingesting contaminated food or grooming themselves after walking and feeding in oil on the beaches.

㊱ Pages 2-16 and 2-17.
Deficiency: Several local fishermen with long time experience disagree with the tidal current projections outlined on these pages. The patterns do not meet with experience, are over-simplified, and do not give an accurate picture of oil dispersal in the event of spills.

㊲ Page 8-51.
Omission: No mention of impact on Hurd Creek fish hatchery for the "Cross-Sound" alternative.

㊳ Page 8-54.
Omission: No discussion of submarine pipeline spill impact on Sequim Bay. This area has a slow flushing action and contaminants could build up.

Page 8-54.
Omission: No discussion of impact of submarine pipeline spill on the commercial oyster beds in Dungeness Bay.

The NTPC project proposal requires over 400-more miles of new crude oil pipeline than any of the other major alternatives--requiring 66 major river crossings. Twenty of those crossings are in the Puget Sound Basin; 17 are in the Columbia Basin. In addition, there will be a minimum of 235 minor river crossings. Unavoidable adverse impacts would reduce salmon and trout populations due to sedimentation of spawning areas. "Severely reduced salmon populations might require 20-years for complete recovery." (BLM 1979)

*5-16 Par 8 and 9 It appears that if it will take up to 20 years for complete recovery of a destroyed salmon population, they might as well be written off as lost. Plans call for too few block or check valves creating an unnecssarily large risk of leak, spill, or rupture at several river crossings.

㊴ 2-115 Par 8: The Dungeness River is not included but should be since it is an important salmon and steelhead spawning river as well as being the source of water for irrigating a large area.

㊵ It should be noted that construction of two submarine lines would cause worst case water quality degradation for a period of minimum of three months as estimated by Northern Tier but could be much longer. The effects of this water condition should have received more thorough analysis by BLM.

This would involve removal of 1,550,000 cubic yards of marine sediments for two pipelines along Ediz Hook inside shore and to Green Point. Of this total 500,000 cubic yards would be recent marine sediments. This would be taken from sediment beds 11 to 16 feet deep inside Ediz Hook and ½ to 1 foot deep in Green Point area. Estimates of cubic yards is minimum.

One acre 1 foot deep equals 1300 cubic yards so the amount of sediment disturbance and removal is considerable and will impact the fishery. Thorough analysis of this impact should be performed by BLM.

Deficiency: It seems bottom fishing in harbor, Green Point area, halibut, blackmouth salmon in the harbor in the fall and winter months and the prime fishing spots for local, commercial, recreational and tourist fishermen are ignored.

㊶ Also, BLM should include the shrimp sports fishery inside Port Angeles Harbor. A favorite deep fishing hold for Haddock is off Green Point.

㊷ Deficiency: Under biological components either reference should be made to pages 3-26 to 3-28 or these materials should be given here, namely that in the "operational phase" dealing with oil spills and an area from Neah Bay to the Canadian shores to Lopez Island and North Central Whidbey Island affected species are molluscs, killer whales on migratory route, sports fisheries, harbor seal, river otter, clams, crabs, oysters, shrimp and large communities of waterfowl.

㊸ Sec. 3; Page 3-10.
Question: Will not the continuous sound of the pumping have an adverse effect on migrating salmon?

㊹ The BLM-DES should include economic impact analysis of potential oil spill impacts upon the fishery industry. Oil spill impacts can be severe to this industry (as experienced by spills such as the Amoco Cadiz): "Scientists say some 50,000 tons of oil, brought in by the tides, remains trapped below the surface in the sand at the Bay of Morlaix, where half of Brittany's oyster production is centered . . . it has been estimated that it still will be more than a decade before edible oysters can be grown in these Brittany mud flats." Also, other spills, such as the Torrey Canyon, can instruct us: "The torrey Canyon incident happened 11 years ago. The Cornwall coast has only this year shown signs of having fully recovered." (Christian Science Monitor, March 13, 1979).

Comment: Several local fishermen, with considerable experience are of the opinion that this document "fails miserably" to achieve its purpose. The information in many areas is inadequate, poorly documented, and "fails completely" to address many important considerations. Furthermore, several of these persons feel that in many areas the information is biased in favor of the applicant while ignoring undesirable aspects of this proposal. The fisheries section of the document is not adequate to access impacts in this very important area.

㊺ Table 3.2.6-4; Page 3-74.
Deficiency: East of the mouth of the Dungeness River is an extensive tract of hardshell clam beds. A spill from the pipeline crossing on the Upper Dungeness River could ultimately affect this resource. A discussion of this subject for all river crossings should be included. Also, the deltaic zone of the Dungeness is an extremely important spawning zone for pink salmon: at Jamestown, approximately 1.5 miles east of the Dungeness River's mouth, is an important nursery area for storry flounder. These aforementioned species could be significantly affected. Deserves a more thorough discussion.

CONT

㊻ Section 3.2.6; Page 3-75; Column 2; Para. 5.
Comment and deficiency: If only one year class of fish would be affected, how would this translate to pink salmon? As the Dungeness River supports pink salmon, it is possible that pink salmon so affected would not recover due to their two year cycle.

㊼ Section 3.2.6; Page 3-78; Column 2, Para. 2.
Deficiency: Statement is extremely general, making the assumption that all streams affected display uniform flow rates. The Dungeness River could not be considered comparable to McDonald Creek--which is what the statement suggests. This should be more specific and should entertain discussion relating to flow rates, source regions, and competency factors for all major stream crossings.

㊽ Section 3.2.7; Page 3-79; Page 2; Column 2.
Question: Physical components - construction phase. Statement again assumes a consistency (flow rate?) which cannot be proven. Flow rates vary seasonally and they vary specific to a stream's source region. If pipe crossings are close to spawning areas or river mouths, what would be the affect on fish and shellfish respectively?

㊾ Section 3.2.7; Page 3-89, Column 1; Para. 2.
Deficiency and question: The statement does not provide a definition of what a sublethal effect is. Does it refer to a specific minimum concentration of a soluable faction? This should be provided.

㊿ Sec. 1.4; Page 1-21, Table 1.1-7.
Deficiency: The criteria for determining a major stream or river should be reevaluated. All streams with significant fish or wildlife values should be considered as major and adequately identified and described in the FES.

(51) Sec. 1.4; Page 1-22, Table 1.4-8.
Omission: This table omits five counties in Washington. Many of the unidentified streams are major anadromous spawning streams, trout streams or have other significant wildlife values.

Sec. 1.4; Pages 1-44/47.
Deficiency: This complete section on pipeline laying is inadequate. It identifies a system of stream crossings that is in violation of Washington State Department of Fisheries standards. It is also too general to quantify the impacts outlined in the impacts section.

Sec. 1.4; Page 1-45, figure 1.4-13.
Deficiency: The drawing demonstrates inadequacy of identified stream crossing safety precautions. All stream crossings should have automatic shut off valves that are more responsive than the 50-100 barrel leak protection under the sound, and which will prevent the types of spills unidentified in Table 3.2.6.2 page 3-70.

Sec. 1.4; Page 1-46, para 1.
Deficiency: The discussed technique appears to violate standard provisions for approval by Washington Department of Fisheries. It also would probably not be approved under Section 404 for any crossings along the west side of Hood Canal since they all involve "aquatic life indigenous to the water body," (as described in CFR 323.4-3 paragraph 5b.4. of Section 404) which would be impacted and, many crossings are close enough to the mouths of streams to require permits because of concentrated shellfish production within the anticipated sediment outfall area. (CFR 323.4-3, paragraph 2).

Sec. 1.4; Page 1-56.
Comment: The discussion should identify that water withdrawals will be consistent with water-rights and low flow needs for fisheries.

Sec. 1.4; Page 1-57; column 1, para. 12.
Omission: There is no discussion about pre-blasting activities to reduce impacts to fish.

(52) Sec. 2.1.1.14; Page 2-37, Column 1, para. 7.
Deficiency: This habitat is a major sport fishery. Also the bottom fishery is a major fishery with heavy use and high success.

(53) Sec. 2.1.2.6; Page 2-57; Column 1, para. 4.
Deficiency: Major stream category should be expanded to cover all streams with significant fish and wildlife values, i.e. those requiring a Section 404 permit; those which local government has indicated to be significant, etc.

Sec. 2.1.2.6; Page 2-57; Table 2.1.2.6-1.
Deficiency: This table should be revised to be consistent with comment above.

Sec. 2.1.2.6; Page 2-57; Columns 1 and 2, para. 6.
Deficiency: Pipeline construction will have to coincide with fish activity. If there are migrating fish in a stream, construction will not be allowed in Washington. Statements that imply positive actions should be consistent with local, State and Federal regulations.

(54) Sec. 2.1.2.6; Page 2-78; Column 2, para. 3.
Deficiency: Both sediment-free water and sediment-free gravel is necessary.

(55) Sec. 2.1.2.6; Page 2-80; Table 2.1.2.6-17.
Deficiency: All streams with significant anadromous fish populations should be included in the table.

(56) Sec. 3.1.6; Page 3-14; Column 1, para. 6.
Omission: The impact of water withdrawals on fish should be discussed further.

(57) Sec. 3.1.6; Page 3-14; Column c, para. 1.
Omission: The bacteriacide to be used is not identified. Data to support water quality dilution needs of 5 to 1 should be included.

(58) Sec. 3.1.6; Page 3-15; para. 3.
Omission: Herring and smelt resources should be included.

(59) Sec. 3.1.6; Page 3-16; Column 1, para. 2.
Omission: There should be an extensive discussion regarding contamination of clambeds, and the beaches of Dungeness Spit.

CONT

(60) Sec. 3.1.7; Page 3-30; Photo
Deficiency: The photo illustrating waterfowl which have been in contact with oil does not demonstrate the serious nature of significant damage which oil can inflict on waterfowl. A photo illustrating fatalities due to oil contact would demonstrate the extent of possible impact better (when placing together with the other contrasting photo presented which reflects oil-free habitat).

(61) Sec. 3.1.7; Page 3-33; Table 3.1.7-9.
Deficiency:

1. Animal or Plant Group: This needs to be expanded to cover benthos and phytoplankton, detritus and other organisms at the bottom of the food chain.
2. Salt Marsh: This is one of the most important habitats to anadromous fish. Recent studies show juveniles feed in marshes during high tide and that marshes may contribute 80+ percent of food. Crustaceans, bottom fishes, fishes open water, invertebrates other than those identified, benthos and detritus would all have need and use salt marshes. Mechanical impacts to birds could be severe since birds use marsh areas for protection as well as feeding. Studies have shown that oil stays in salt marshes for long periods.
3. Eelgrass Beds - Fishes, Open Water: Herring spawning is very important. Oiling during spawning would have significant impacts.
4. Sand - Molluaks: Razor clams are a very important resource with a low resistance to oiling.
5. Mud - Molluska: Commercial oyster operations in Hood Canal could be destroyed by oil spills in the Olympic Mountains streams. If oil penetrates and is retained in the mud the area is lost for as many seasons as it takes the mud to clear.

(62) Sec. 3.1.7; Page 3-50; Column 2, para. 4.
Omission: The statement implies that fish are in the Straits in equal numbers all the time. This is not a correct assumption. In Puget Sound the Fraser River Run is extremely important and shortlived. If fishermen miss it they have lost much of their seasonal take. This is a very complex topic and it should be expanded and explained. Also, a worst case impact should be evaluated in 1978-79 dollars. It would seem logical to present a worst case scenario for the subject matter of this paragraph.

(63) Sec. 3.1.7; Page 3-50; Column 2, para. 5.
Omission: Assessment of losses should have been presented in the DES, and certainly in the FES. Canadian government studies related to the Thompson Inquiry may assist in this analysis.

(64) Sec. 3.1.7; Page 3-50, 51.
Omission: Impacts related to Canadian fishery should be adequately addressed in this section.

(65) Sec. 3.2.4; Page 3-61; Column 2, para. 3 & 4.
Deficiency: This statement is not consistent with previous statements about sesmic and geologic hazards along the corridor. Spring freshettes frequently have velocities of small outbursts along certain streams. The Dungeness River, for one, has serious erosion problems and could create problems. Alternative methods or locations for crossing such streams should be suggested and evaluated.

(66) Sec. 3.2.5; Page 3-63; para 1.
Deficiency: Since this topsoil is coming from a known source and contributing to degradation of stream quality it could fall under the NPDES guidelines for point source discharges. This should be investigated and discussed by BLM.

Sec. 3.2.6; Page 3-67; para. 4.
Deficiency: Flushing rates are variable and depend on the time of year material is deposited, type of material deposited and physical characteristics of a stream.

(67) Sec. 3.2.6; Page 3-67; column 2, para. 3.
Deficiency: There should be a discussion of the chemical composition of the water at flush.

(68) Sec. 3.2.6; Page 3-67; column 2, para. 2.
Comment: If short-term impacts occur at the right time it could eliminate a pink salmon run since they have a 2-year cycle.

(69) Sec. 2.3.5; Page 3-66; Column 1, para. 1.
Omission: BLM should include data relative to benthos and detritus production from marshes and other wetland habitats; what effect oil will have on this production; and, what impacts these could have on fish resources.

(70) Sec. 3.2.5; Page 3-68; Table 3.2.6-1.
Omission: This table displays actions and does not address impacts. It should identify: (1) Duration of time span the sediment will impact each stream, (2) Sediment draft distance, and (3) the estimated deposition zone from the source-point to the point of zero deposit.

(71) Sec. 3.2.5; Page 3-72; Column 2, para. 6.
Deficiency: This statement implies an action that cannot occur. Due to screening criteria, no fish will enter the pipe. If fish start entering the pipe, pumping will be shut down.

(72) Sc. 5.1.6; Page 5-5, para. 2.
Omission: The impacts of the reduction of a base flow of 0.5 percent on fish activities throughout the year should be discussed more thoroughly.

Sec. 5.1.6; Page 5-5; para. 2.
Omission: Further study must be made of the impacts of siltation in Seibert Creek on fish; the maximum level turbidity factors will reach; and, the effects on $O_2$ levels.

(73) Sec. 5.1.6; Page 5-5; para. 2.
Omission: Reviewers have discussed various aspects of dumping of excessive amounts of water used for testing tanks, etc. into Seibert Creek. What impacts would this have on fish resources at different times of the year? BLM language is a statement and not an identification of impacts.

(74) Sec. 5.1.7; Page 5-5.
Omission: Marine Resources - Construction phase identifies numerous sediments nutrients, solubles, etc. and relates how these coule reduce oxygen levels, and increase chemical and biochemical contamination of sea water. The Biological Components section fails to discuss mortalities

CONT

(74) due to the oxygen failure addressed in Physical Components. The impacts are generalized and somewhat abstractional. The document never says what may really happen in numbers of fish that could be lost if conditions were right or loss of revenue if the chemical build up in fish did occur. A worse case scenerio should be presented. in compliance with NEPA.

(75) Sec. 5.1.7; Page 5-5,6.
Deficiency: Describe the aquatic resources of Seibert Creek - its fishery and probable effects of discharges from the project on this. What restitution is to be made for the loss of this public resource?

Comment: Throughout the BLM document there are many references related to fishery. However, there is insufficient analysis regarding the economic value of the area fishery.

J

## FOREST PRODUCTS

The forest products industry would be impacted by this proposal. The mills are particularly vulnerable because this proposal impacts on them in several vital areas such as electrical power, air quality, log storage, and water quality.

Both ITT-Rayonier and Crown Zellerbach purchase their power through the City of Port Angeles and both have faced, and in Rayonier's case is continuing to face, needs for significant increases in electrical power. A large part of this need was necessitated in both cases by requirements that the mills clean up their air and water emissions. Northern Tier should be obligated to secure their own electrical power without any attempts to take power that has already been allocated to the mills.

Air quality is an area where both mills have made great strides to clean up their air emissions. Again, no burdens should be placed on local industry to take additional expensive steps to clean up their air emissions if a significant deterioration of air quality appears possible from oil unloading operations at the marine terminal. The analysis should be on the basis of what steps Northern Tier is going to take to insure that the impact on air quality will not be significant.

An acute problem of immediate significance is that of log storage within Port Angeles harbor. Northern Tier has staked out an area for their marine terminal which would take a large area now used for log storage. Although the entire log storage area is not full, this is done for the purpose of having room to maneuver the logs so that a specific type of log can be sorted out to meet a specific need at the mill. If the mills were denied log storage or had it severely reduced, it would have a substantial financial impact on the mills. Dry-land storage and handling of logs is a great deal more difficult and expensive than water storage. In the case of ITT-Rayonier, it would significantly contribute to the air quality problem in downtown Port Angeles because of the large increase in the number of trucks that would have to traverse the downtown area.

The concern over water quality is quite similar to that of air quality in that both major mills have made great strides in cleaning up their water effluent. In ITT-Rayonier's case they are in the process of converting to secondary treatment at great expense in order to insure water quality remains at a high level. Again, no burdens should be placed on the mills for additional improvements if it appears that Northern Tier's operation would result in a serious deterioration of water quality. Northern Tier's proposal must be analyzed from the point of view of what steps is it necessary for Northern Tier to take to insure water quality remains at its present high level.

❶ Deficiency: The effect of losing over 117 acres of water storage area will force I.T.T. and Pen Ply to utilize more dry land storage, thus causing loss of additional farm and forest land to log dumps which in turn impacts living qualities of rural residents, loss of producing forest and agricultural land, causes greater fuel consumption by trucks and log-loading equipment. Industry estimates show a $20 - $25 per thousand increase in log handling costs for export logs. The BLM should address this concern.

❷ Omission: Forest land problems created by the building of the tank farm and pipe line relate primarily to property lost to forest production. No discussion is put forth nor reasons given for taking a 90 foot swath of producing land next to non-producing Bonneville right-of-way. Reasons should be given for not using the existing cleared Bonneville right-of-way for pipe line burial. No effort has been made to tell how land is to be used productively following line construction nor how much future economic effect the removal of producing agricultrual and forest land will have.

❸ Omission: The current proposal, and any petroleum-related secondary expansion at or near the proposed tank farm site will impact the productivity of seed orchards to the east of the site. Also, the impacts of air polution on Christmas tree production and agricultural production is not fully addressed.

❹ Sect. 3.1.12; P.3-41.
Question: What will be the impact of both chronic spillage and periodic large spills on the log inventory in the harbor? Industry sources have mixed opinions regarding the level of significant danger caused by the contact of oil with the water-stored log inventories. Some sources indicate a decrease in value for some uses (primarily pulp production and export) if logs were oil soaked in any significant degree. The BLM should research and further discuss the possible economic impact.

## GEOLOGY

K

❶ Deficiency: This section is not adequate. See the Dames and Moore studies of Clallam County for a nuclear power plant. See the Geology maps in the State Department of Geology under DNR in Olympia. Dr. Rogers' study of the area would be pertinent (University of Washington PhD Thesis). There is not time for us to do the research to cite all the errors and omissions in this section, but they are numerous: faults along the Hood Canal are believed to be active, probable fault along the Strait of Juan de Fuca, probable faults along the valleys in Port Angeles pointing at the berthing facility, evidence of severe faulting at the end of Miller Peninsula, question of migration of the Olympic Peninsula away from inner Puget Sound area, known geologically active fault on Dow Mountain near the south end of Hood Canal, known earthquake epicenter under Blyn Mountain very close to the pipeline route. The evidence of geologic instability was the reason given for the abandonment of the nuclear power plant in eastern Clallam County.

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② Sec. 3.1.4; Page 3-10.11.12.
Omission: The summary neglects to mention the possibility that the project itself may cause erosion of Dungeness Hook due to interference with littoral drift as the three submarine pipelines ascend the bank to the storage facility. The change in the harbor bottom by placement of the pipeline from Ediz Hook to shore may prove highly significant in light of the practice of ships to drop and drag anchor at the entrance of the harbor as a braking mechanism. The injection of water into the soil at the tank farm for waste disposal may lubricate the nearby bluff area and contribute to landsliding. What studies have been made of this process? Some further information is needed to determine whether this will aggravate the landsliding already endangering the residential development to the west of the tank farm site. The entire presentation on soil stability is seriously deficient as is description of known earthquake epicenters and faults in the area.

③ As to the harbor construction having negligible effects, there is no discussion of changes in circulation of water within the harbor by the docks, ships, booms, etc. which might well affect the deposition of geologic materials. Will the pipeline across the harbor act as a sill to retain sediments at the harbor bottom?

④ How and to what extent will the permeability, porosity, cementation and moisture content of the soils at Green Point be changed by the project? As is characteristic of this document, the references cited are insufficient and not available to the reviewer.

⑤ In discussing slope failure on the west side of Ediz Hook caused by pile driving and laying pipe on the east side, it should be noted that the Hook has been eroding with threatened loss of the harbor and is being shored up by rip rap on the western side. Where was the breach in relation to the project site? Please give cross section to scale of the Hook at the project site with and without the project in place. What is the risk of adding to the earlier breach?

⑥ At abandonment, why would submarine pipes be allowed to be left to rust with oil contaminated water in them? Why shouldn't they be pulled out?

⑦ Sec. 3.1.5.
Question: What "fluid leaks" are expected in addition to oil leaks? Diesel? Chlorinated hydrocarbons?

⑧ Sec. 1.4; Page 1-45.
Deficiency: Figure 1.4-12 should also show plans for pipeline burial in various unstable earth conditions (i.e., clay, fractured rock bentonites, slip or slump areas, etc.).

Deficiency: No provision is made within the pipeline trench to contain an oil spill. Leak detection to only .5% means that 4600+/- barrels could be indectectably lost per day at maximum flow. This quantity of oil cannot be allowed to soak into the ground. BLM must analyze this matter further and require more safeguards.

⑨ Deficiency: Outburst flooding: obviously the Dungeness River is capable of this kind of action with intense scouring in the course of flooding. What other rivers have potential for ripping out or damaging the pipeline either from water scour and pressure or from heavy debris dragging into the stream bottom? Give the frequency of major flood events for the larger rivers.

Deficiency: Figure 1.4-13 does not show adequate protection to the river in the event of a pipe rupture.

Sec. 1.4; Page 1-46.
Deficiency: Backfilling procedures for streambeds should be carefully chosen to prevent scouring and to blend in with the existing bottom. If the river is in a downcutting stage, steps must be taken to stabilize the bed.

⑩ Sec. 1.4.
Omission: Foundation bearing characteristics for the tank farm should already be known partially from analysis of core samples. Where is this data? Is this Vashon Drift material or something else? Such data belong in an urgently needed Technical Addendum.

⑪ Sec. 2.1.1.4; Page 2-11.
Omission: It should be noted that in road cuts to the south and west of the tank farm property, a varying degree of soil stability is displayed. A more detailed examination of the property is required.

⑫ Sec. 3.1.4; Page 3-11.
Omission: There is no explanation as to where the fill material comes from, or where the spoils are taken. The quantities involved could have major topographic effects on the source areas.

⑬ Sec. 1.1.
Omission: In discussing surplus excavation materials and control of erosion, please describe quantities of sediment likely to escape the site into Seibert Creek or the Strait. How will resonable limits for erosion be set? How monitored? What provision will be made for enforcement of this? (Will a performance bond be posted?)

⑭ Sec. 3.1.4; Page 3-11.
Deficiency: The cutting of the launchway ramp in the bluff at Green Point could create major instability problems. Special design features for this structure should be outlined.
Discussion should includd design critera vis-a-vis high wind and wave action.

⑮ Sec. 3.1.4; Page 3-11.
Deficiency: Under the heading Geologic Hazards, nothing is said about the effect of alterations of the bluff at Green Point on the dynamic, geohydraulic conditions that maintain the Dungeness Spit. Interference with the process of shoreline drift predictably causes problems in the deposition area. The effect of this alteration on the "largest federal waterfowl refuge in Washington state" (page 2-22) must be considered more fully than in a single sentence buried on page 6-2. Displacement of fish migrating along the shoreline must also be addressed, along with bottom and other fishery.

⑯ Sec. 2.1.1.4; Page 2-11.
Deficiency: The bluffs along the shore at Green Point are rapidly eroding and serve to feed Dungeness Spit.

CONT

⑯ The entire shoreline from Port Angeles to the base of Dungeness Spit was placed in a conservancy environment and removed from intense residential development despite wonderful view property for the reason of this instability.

Sec. 2.1.1.4; Page 2-11 (con't.)
from intense residential development despite wonderful view property for the reason of this instability.

Although Shannon and Wilson reported that the bluffs are "relatively stable," Ralph Kealer, shoreline specialist for the U.S. Geological Survey, has stated that the average erosion rate for the bluffs in the area is 20 to 40 inches per year. (Seattle Times, 2/10/79)

⑰ Deficiency: Please give the full report of Shannon and Wilson for the soil cores done at the tank farm and harbor sites. What was their report regarding liquefaction under seismic conditions? Regarding weight bearing capability?

Sec. 3.2.4; Page 3-59.
Omission: Excavation and grading for the pipeline might also intercept and/or divert some shallow aquifers. Steps should be taken to protect these water sources.

⑱ Sec. 3.2.5; Page 3-65.
Omission: This section speaks only about soil contamination. There should be some note about groundwater contamination.

⑲ Sec. 4.4; Page 4.2.
Omission: Mitigating measures for the topographic disturbance at the Green Point Bluff should be discussed.

Sec. 5.1.5; Page 5-3.
Deficiency: Settling basins should be designed with maximum rainfall conditions in mind. Unusually high rainfall might seriously damage the slopes in the launch ramp.

⑳ Sec. 5.2.4; Page 5-13.
Question: BLM presents predictions of geologic events for a 20 year expected life, but state that the pipeline may have a much longer life. Shouldn't the events be predicted on a maximum lifetime?

㉑ Page 2-52.
Question: What two surface rupture faults are you referring to in Washington state on page 2-52?

㉒ Page 2-53.
Deficiency: Liquefaction: Where in Washington are the areas identified where the pipeline could be affected by this and what measures will be taken to offset this? Were the marshy areas along Hood Canal included? The unstable soils at Green Point?

㉓ Landslides: Where in Washington are landslide areas capable of causing pipeline rupture? What is the frequency and magnitude of slides in these areas? What measures are proposed to offset this?

㉔ Sec. 7.2.2; Page 7-2.
Question: It is stated elsewhere that oil saturated soil might be removed. In this section, it is stated that reclamation is through tilling and nutrients. Which is planned?

Sec. 1.4; Page 1-14.
Deficiency: A paragraph discusses the permiability of onsite soils relative to their use as dikes. If they are found to be unacceptable, material will have to be brought in for the dikes and the floor of the catch basins. (The permiability of the floor of the basin is never discussed.)

Sec. 2; Page 2-154.
Comment: Physical components: A very good and accurate statement.

Paragraph 22, Page 1-58.
Deficiency: This comment is inconsistent with other statements in the DES that discuss slope stabilization at stream crossings.

㉕ Page 3-13; Columb 1, para. 3.
Omission: There is no discussion of where these 680 to 1,540 tons of soil will go. The statement about erosion on the coastal bluff needs to be more adequately documented.

㉖ Question: Will compression of subsoil water bearing layers by the weight of the tanks alter water courses so as to aggravate further the erosion problems along the bluff near the subdivision?

Omission: Table 5.1-4 does not indicate loss of wildlife and fish and shellfish habitats and subsequent wildlife and fisheries losses to slides, etc. discussed under construction. Also, there is no discussion of the effect a major slide would have on the natural erosion cycle of the bluff or what effect tidal washing of excessive amounts of materials would have on Dungeness Spit.

㉗ Page 5-2, 5.1.5.
Omission: There is no discussion of soil loss on the bluff at Green Point.

Page 5-5, 5.1.6.
Omission: There is no discussion of possible impacts on the shoreline from installing the pipeline and the trough on the bluff at Green Point.

Page 7-2; 7.1.1
Omission: Discussion of alteration of Green Point Bluff and possible alteration of Dungeness Spit needs to be included.

L

## HARBOR MANAGEMENT

Some comments related to the harbor are discussed in other sections of this report, including "Water Quality", "Fisheries", "Air Quality", "Recreation and Tourism".

Section 1.1; Page 6-1; Para. 1.
Question: At what point are the cumulative impacts of 3 tanker berths 3 submarine lines and 35 tanks at the onshore facility addressed adequately? Air quality, noise, vessel traffic, bluff erosion are a few areas of concern.

① Sec.1.1; Page 1-5; col. 1.
Question: There appears to be an inconsistancy here. A part of table 1.3-1 summarized states the Department of the Army is the

CONT

① activity required to approve dredging of the Port. Also that the Environmental Protection Agency must approve the disposal of dredge material. Par. 2 Page 1-7 states "... dredging would not be required."

② Page 1-48.
Deficiency: What disposal is made of an in-bound, filled tanker 24 hours away which is having mechanical problems affecting control of the ship? What disposal is made of a vessel entering the harbor with a fire on board? What is done with a ship at the moorage with a fire on board? (minor and major fires to be considered).

③ Deficiency: The issue of storage and handling of bunker fuel has not been addressed adequately. Different possibilities should be addressed (i.e. fuel from Washington refineries; fuel from California; storage in tankers on Ediz Hook; storage in barges; etc.)

④ Sec. 1.1; Page 1-50; Col. 1.
Deficiency: Although the project has a projected life span of 20 years, page 1-50 states that berthing structures would probably not be taken out of service. Why not? What industries would they be supporting?

⑤ Section 1.4; page 1-49.
Deficinecy: The ES indicated that the terminal dispatcher will advise the tanker personnel which anchorage area to occupy. Are there anchorage areas designated in the Port Angeles area? The ES does not discuss the possible location of any anchorage areas. Anchorage within the harbor for a so called "super tanker" is very limited and probably could not be permitted with the present traffic in the harbor and the number of vessels which presently anchor there.

⑥ Section 2.1.1.13; Page 2-32; Para. 2. Also Table 2.1.1.13-3 and Map III-4 Addendum.
"Piers" might be better described as berths. There certainly are not 30 projections into the harbor for docking, but rather far fewer projections able to moor vessels of varing kinds. Also Map does not designate all "pier" areas listed, i.e., Port of Port Angeles log shipping, M & R Timber dock, nor Port Boat Haven, etc.

⑦ Section 1; Page 2-35.
Deficiency: "Although the line is satisfactory for current use" and speaks to need for new slip barge at Port Townsend, rail abandonment (page 2-156) discussions locally project a potential need for a Port Angeles Rail barge slip. Present use of rail line is less than adequate because of restricted load limits placed on shippers. (Source: Crown Z communication, Dec. 1978 regarding load limits; slip and barge information in local newspaper). Where could the new rail barge slip be located in the Port Angeles harbor?

Page 3-42, col. 1 & 2.
Deficinecy: Does not speak to total project throughput of 1.3 mbpd.

Deficiency: Does not adequately discuss fuel barge traffic impacts relating to both two berth operation and total project operation for throughput 1.3 mbpd.

Deficiency: How many additional tugs and towboats will be needed for total project operation?

⑧ Deficiency: Statistics for vessel traffic given for Straits for 1976. What are increases for 1977, 1978 and projected future increases related to economic growth in Puget Sound area? Also increases for local harbor vessel traffic? Source of data?

⑨ Question: Where would extra tugboats and fuel barges anchor?

⑩ Deficiency: Does not adequately speak to tanker queing problems, location of anchorage areas, possible economic impact by forced waiting periods for other vessels, or related hazards to this kind of traffic congestion, and weather conditions.

⑪ Deficiency: What is space occupancy required for anchorage of 325,000 dwt tankers? How close can another vessel safely anchor? Who would designate and enforce anchorage areas?

⑫ Para. 3, col. 2.
Deficiency: What impact would vessels trying to leave harbor in case of a fire have on other vessel safety and capability of dealing with fire in a small enclosed harbor?

⑬ Deficiency: How wide a space is required for tanker approach lane in harbor? Is it safe for a 325,000 dwt tanker to enter harbor with simultaneous meeting of departing loaded log ship or passenger ferry Coho? Is there room for same? Other moving traffic?

⑭ Para. 3, col 2; Page 3-42.
Deficiency: Does not speak to combined total vessel traffic relating to risk factors for fires and explosions in the harbor. Does not include tugs, fuel barges, ferry trips, commercial and recreational boating as related to total traffic. Does not include increased growth vessel traffic all classes for seven year period from 1976 adding the five year time lapse for Northern Tier 933,000 throughput.

⑮ Error: Discrepency in explosion or fire statistics. Gives one in 12.24 years and 15.62 years respectively for 390 calls per day. Site Certification states (Vol. 3 pt. 2) one in every 11 years for 395 tanker port calls. Neither figure relates (2.11-49) to risk factor in enclosed harbor from other vessel probability.

⑯ Question: Data source for explosion and fire statistics? What would be distances for vessels from tankers at berth, in turning departure pattern, in vessel approach lane with ongoing moving traffic?

⑰ Deficiency: Does not speak to loss of steering or grounding of tanker onshore or to collision from other moving vessel relating to fire and explosion potential.

⑱ Sec. 3.1.13; Page 3-42; col. 2, para. 4.
Deficiency: "Would most likely remain in place" as abandonment procedure for submarine pipeline is not valid.

⑲ Sec. 2.1.1.14; Page 2-37
Deficiency/Omission: The number of passengers carried to and from Victoria on the ferry Coho should also be listed. Especially peaks and lows, as well as averages.

⑳ Sec. 2.1.1.5; Page 2-38.
Deficiency: Why use Arco for data source of traffic in Strait? Puget Sound pilots would be a much more accurate source. Does Puget Sound have less vessel shipping than Victoria/Vancouver area? The Strait is the trunkline to Puget Sound for vessel shipping also. Are there more tankers than other types of freight vessels going to Washington ports? Doubtful! V.T.S. is presently only for traffic east of Port Angeles.

㉑ Table 2.1.1.15-1.
Average day figures are inaccurate for all vessels.

㉒ Sec. 2.1.1.15; Page 2-38; Col. 2, para. 3.
Again, question use of area figures rather than Coast Guard and Puget Sound pilots.

CONT

㉓ Page 2-39; Para. 1.
According to 13th Coast Guard Dist. Public Affairs Officer, VTS regulations do not require ferries on scheduled runs to report their movements except during periods of low visibility or darkness. Source: Seattle Post Intelligencer 1/17/79 "Vessel Traffic System Blamed for Collision." Were Arco figures based on vessel numbers or vessel trips?

㉔ Table 2.1.1.15-2; Page 2-39.
Deficiency: Why was a similar table not developed for U. S. ownership of commerical fishing and household pleasure boats in the Straits to the Port Townsend area?

㉕ Table 2.1.1.15; Para. 1; Page 2-41.
There occurs a biased statement in 2nd sentence. Uses are not limited to serving the forest product industries and as a refuge for tankers and other vessels in transit. If such were correct, why should we change one limiting industry for another much more potentially polluting and hazardous one. The harbor does serve the needs of the forest industry since it is a major employer in the area. It also serves as a fish buying station for commercial fishermen; as the international gateway to Victoria via the ferry Coho for tourists; provides recreational fishing not only locally, but for people coming from all parts of the U. S. Harbor limiting factors are its size, primarily.

㉖ Table 2.1.1.15-8; Page 2-42
Deficiency: Why were intra-harbor movements excluded from the table? Why were 1977 figures not used? Were commercial fishing catches entering harbor included in the table? If no, why not? Why was data adjusted relative to foreign oil imports? Why was vessel count not also used?

㉗ Para. 2; Page 2-42.
Deficiency/Error: The last sentence appears to be a comment not based upon fact. Many motel owners rent to college students during off season which is a steady income use supplementing summer tourist season peak usage.

㉘ Table 2.2.1.13; Page 2-155; Para. 1.
Deficiency/Error/Question: "However, because of the harbor's deep-draft capabilities, it could become a commodity transshipment point with large bulk carriers off loading commodities for transshipment via smaller vessels or barges to other ports." Then on page 6-1 under "Tanker Unloading Berths" Para. 3 "The commitment of the harbor resources to the proposed project could deter the development of additional deep draft piers to handle commodities other than crude oil during the short term." Short term is defined in Para. 2 of Page 6-1 under 6. The relationship between local short term, etc. (at top of page). "Short term will be the 20 year life time on which the project economics have been based." Continued reading under tanker unloading and on page 2 provides more details. Page 6-1 speaks to future harbor growth restrictions. Yet para. 1 of tanker unloading berths, on the same page, speaks of existing uses being restricted, moved or discontinued. What is the economic impact and loss to the community of the short and long term?

㉙ Sec. 2.2.14; Page 2-156; Col. 1, para. 6.
The elimination of not only present boat launch facilities should be addressed, but also, limitation on future boat launching facilities should be discussed.

㉚ Sec. 3.1.7; Page 3-34; Col. 2, para. 2.
Deficiency: "If" is not proper procedure description for abandonment phase. What effect on Ediz Hook soil erosion, soil stability would removal of hugh pilings along shoreline have? What effect would ongoing vessel traffic and other uses have on anchor damage or other damage to submarine pipelines if left in place?

㉛ Para. 2; Page 3-39.
Deficiency: All impacts mentioned will not only be combined impacts during minimum 18 month construction period only to project impact but must be combined and related to already existing community impacts in port and onshore facilities.

㉜ Sec. 3.1.13; Page 3-39; Col. 2, para. 2
Question: Northern Tier project would force removal and relocation of existing industrial and recreational uses in the harbor area. How can future industrial development be spoken to in terms of lesser attractivenessfor an industrial site which would then be fully occupied? Para. 2, page 3-39 states no other harbor areas available.

㉝ Page 3-39; Column 2; Paragraph 2.
Deficiency: What is exact acreage of harbor and tideland current mill usage by Crown Zellerbach and ITT Rayonier forced to vacate to Northern Tier project? About 55% could result in further industrial curtailment.

Deficiency: Does not speak to location displacement site for six or more chip barges requiring harbor ingress and egress, storage and access availability for continuing mill operation Crown Z and ITT Rayonier.

Deficiency: An at-random choice of mill log storage relocation suggested as adequate by Northern Tier is inadequate. Said relocation related to two separate current operating industries with significant economic impact on community at large, and impacts must be related to same, both short and long-term.

Deficiency: Does not speak to additional economic, traffic and air quality impacts as added to current existing, additional Northern Tier impacts and increased and total combined impacts totaled for all areas.

Deficiency: Impact stated in all cases relate to initial construction and not impacts related to total project.

㉞ Section 3.1.12; Page 3-39.
Deficiency: The DES indicated that existing log storage area, pilot station, V.O.R. station and marina and boat ramp for small boats would be displaced. The FES should discuss specific sites to relocate these facilities. Providing no site is available to relocate any one of these facilities the FES should discuss the impact the closing of these facilities will have on the community. The FES should also address at whose expense would they be moved!

Paragraph 3; Col. 2; Page 3-39.
Deficiency: Does not give specific relocation sites available for pilot's station, Thunderbird Boathouse. What impact, what less desirable location on each entity have and also impact added to restricted access for all entities?

㉟ Question: Why is the possibility of relocating the pilot's station to the Coast Guard base given as an alternate when the Coast Guard base itself will be restricted in current usage from initial construction and impacted to an unspecified degree with total project operation?

㊱ Deficiency: Does not speak to safety problems and hazards related to restricted uses and less desirable locations for pilot's station, Thunderbird Boathouse and boat launches.

Deficiency: Does not address possibility of loss of pilot's station and Coast Guard to another area location by Northern Tier project, and economic loss related thereto.

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㊱ Deficiency: Exact land site description and availability for relocation of pilot's station, Thunderbird Boathouse and related buildings necessary and availability of parking space.

Deficiency: Where would relocation of public beach land now available on Ediz Hook be relocated?

Deficiency: Does not speak to specific impact on U. S. Coast Guard during initial construction and further impact from total project impact on Coast Guard station.

Deficiency: Does not specify exactly how much and at what site any recreational public land or beach use on Ediz Hook would be available for use and tolerable for current public uses. What impact second phase for total project?

Deficiency: Does not give usage impact restriction for current continued use Peninsula Plywood Log Dump during construction? What impact from construction total project?

Deficiency: Does not give impact and specific restrictions on current usage for Foss Tug during construction. What impact from construction second phase total project?

Deficiency: Does not give specific restrictions on current and ongoing useage by Crown Zellerbach during construction. Impact on second phase construction total project?

Deficiency: Does not identify intensities and restrictions related to each individual user. Impact must be given for combined impacts with already existing impacts and effect on land users including residential community. Also combined total impacts during second construction phase for total project.

Deficiency: Specific impact to all harbor users during construction when harbor entrance partially constricted for minimum of three month period. (Vol. 3, part 2, Site Cert. N. Tier Pipeline, Page 2.10-3)
Sec. 3.1.12; Page 3-40; Col. 2, para. 1.
Error: To state future industrial harbor use might be affected by project is not correct statement when in reality current industrial and recreational use of harbor and land areas must be relocated for initial phase of construction.

Question: Would total project construction force relocation of other industrial and recreational usage?

㊲ Section 3.1.12; Page 3-41.
Deficiency: The first paragraph should explain the impacts of a major oil spill on harbor industries.

㊳ Paragraph 1, Col. 1; Page 3-42.
Deficiency: Tourist season definition for June-September is too narrow a scope.

Question: Would there be vessel anchorage for current harbor users during 3 month minimum period given for restriction of harbor entry usage? Economic impact?

Error: States June-September recreational use of harbor will be at maximum during construction 1980. Site certification, vol. 3, part 2, pate 2.20-6 states construction by Northern Tier will render existing boat launching and mooring facilities on Ediz Hook unusable.

Error: Assumes bottom pull method of submarine pipe laying. Method is not specified in proposal (either jetting or bottom pull).

Deficiency: What is total number of barges, tugs, launches and other water related equipment and space occupancy area required for same in harbor which Northern Tier will be using at maximum construction peak?

Deficiency: What effect will construction activity have on interference with Port Angeles-Victoria ferry scheduled runs?

㊴ Paragraph 1, Col. 1; Page 3-46.
Deficiency: Does not adequately address the restrictions and impact on Coast Guard Air Operation with 175 high tankers, 80 foot towers, marine arms, all located approximately 600 feet offset from runway centerline and 600 feet from threshold. "Might be construed as hazards" does not properly address impact on Coast Guard facility.

㊵ Paragraph 2, Col. 1; Page 3-50.
Error: Does not speak to two boat launches at Ediz Hook which would be displaced. One is for smaller boats and is not used during winter months.

Deficiency: Does not state relocation costs and operating losses for mill log storage, Thunderbird Boathouse and two boat launches.

Deficiency: Must address relocation impact of recreational facilities in terms of not only financial loss to the operator or associated costs but in terms of public land use intent and water access for recreational purposes. Must also include impacts from loss of public beach land on Ediz Hook, impact from restricted usage by relocation and economic cost to users if sites lost to local harbor in terms of insufficient related facilities now available and distance traveled for usage.

㊶ Paragraph 2, Col. 2; Page 3-54.
Deficiency: Does not adequately address impact of inhibited recreational boating in the harbor (inhibit means to forbid or restrict). What effect would this have on Salmon Derby and all other recreational related related activities during operation?

Deficiency: Does not speak to economic, social and recreational impact on community as result of loss of or restricted use of harbor area.

㊷ Section 4.13; Page 4-7.
Deficiency/Question: The ES indicates that pleasure and fishing craft would not be allowed within a predetermined distance of tankers discharging crude oil. The ES should indicate this distance and discuss the impact this will have on pleasure and fishing craft. Also will there be restrictions for other harbor traffic?

㊸ Sec. 5.1-12; Page 5-8; Col. 2, Table 5.1.12-1.
Question: What are the economic and energy impacts of "the" one re-construction and operation of the Thunderbird Boathouse facility, log storage areas, the pilot station, one public boat launch if they are to be relocated?

Sec. 5.1.12; Page 5-8.
Deficiency: In one land use discussion, the operation of the planned municipal pier should be addressed.

Section 5.1.12; Page 5-8.
Deficiency/Omission/Error/Question: There are a number of proposals under active consideration for harbor usage, some with very significant impacts. Why were these proposals not addressed? Anyone reading the local Daily and Seattle newspapers would have an awareness of proposals. Why were possible harbor use option foreclosures not detailed and described? The Port of Port Angeles and the Port Angeles Chamber of Commerce should be contacted for current information.

Table 5.1.12; Page 5-8.
Deficiency/Omission/Error/Question/Mitigation: Location of project

CONT

㊸ as described is too vague to determine displacement of amount of log storage. What are impacts of additional log traffic on city streets (i.e., traffic control and street maintenance?) Location of log storage land available should be noted. What effect will dry land log storage have on air quality and noise pollution? What impact would dry land log storage costs have on the competitive ability of local industry in the pulp and paper processing markets?

Section 2; Table 5.1.12-1; Page 5-8.
Deficiency/Omission/Question/Mitigation: An alternate location should be acquired for the pilot station. Why has this not been done by applicant? Who would be responsible for relocation costs?

Section 3; Talbe 5.1.12-1; Page 5-8.
Deficiency/Omission/Question/Mitigation/: An alternate site within the harbor should be identified for the Thunderbird Boat Marina and 2 public boat launch ramps. Why has this been neglected by applicant after assuring the community it would be done? Who would be responsible for relocation costs of public boat launch sites? What is the impact on regional recreation, the community and the tourist industry?

Section 5; Table 5.1.12-1; Page 5-8.
Deficiency/Omission/Error/Question: "Nuisance" is an error. What specifically will the Northern Tier proposal impacts be to the Coast Guard base, harbor log and chip barge storage, recreational use of the harbor, Crown Zellerbach mill (including motor vehicle traffic) and vessel traffic in the harbor? None of these have been adequately addressed under description of project, impacts or mitigating measures. What are the cost factors involved in these impacts?

㊹ Section 5.1.13; Para. 1 & 2; Page 5-9.
Deficiency/Omission/Error/Question: Where will tanker queueing take place, in the harbor or elsewhere? How large is the non-anchorage area to be over the submarine pipelines? Why has it not been designated or shown in diagram form? Exactly what impact will increased tanker traffic and queueing have on restricting present incoming and outgoing vessel traffic (i.e., log booms, barges, log ships, the ferry Coho, commercial fishing boats and recreational boating - both motor and sail)? What will the impact be on inner harbor movement of log rafts and chip barge movement from one place to another within the harbor? What impact would restricted anchorage area designation have on present vessel anchorage? How would a VLCC, 325,000 DWT tanker at anchor in the harbor affect or restrict existing harbor traffic usage and vessel movement? How many tankers of what size could be anchored in the harbor and still have the present normal vessel traffic movement? Where outside the harbor would waiting tankers anchor? What specifically would be the "occasional inconvenience to other commercial vessel traffic?" Is this local commercial vessel traffic or is it commercial traffic going in sound or out to sea? Or both?

Section 5.1.13; Sec. #2; Page 5-9.
Deficiency/Omission/Error/Question: If VOR (Vertical Omni Range) station would need to be relocated, there would, not could be, adverse impacts on air navigation. Why has an alternate site for the VOR not been located? Who would be responsible for relocation cost? VOR interference - what impact would it have on the safe navigation of aircraft flying the the area? How major an undertaking is the relocating of the VOR station? What else on the Coast Guard base will need to be relocated if Northern Tier locates on Ediz Hook?

Deficiency: The BLM-DES is inadequate in its coverage of maintenance and repair of tankers, tugs, fuel lighters, etc., utilizing the port if an oilport is sited in Port Angeles. This issue should be addressed thoroughly.

㊺ Sec. 6.1; Page 6-1; Para. 3.
Deficiency/Question: A 20 plus year commitment of the harbor to the Northern Tier project with both immediate and long term restrictions on industrial and recreational uses are an economic strangulation for the community. The benefits of other harbor uses should be evaluated. The NEPA requires such analysis of long term versus short term benefits.

㊻ Sec. 6.1; Page 6-7; Col. 1, para. 1.
Error: The Oceanographic Commission of Washington in a 1975 offshore oil study addresses the topic of the siting of refineries and petrochemical plants in a different manner. "Offshore Petroleum Transfer Systems For Washington State." Feasibility study. Page IV, 157, last paragraph, Page IV, 158, first paragraph. BLM should further research this topic (additional discussion of this topic in the "Land Use" section of this report).

㊼ Section 6.3; Page 6-3.
Omission: The statement does not explain the size of the harbor easement NTPC intends to obtain for the unloading facility. The easement if much larger than what is needed for 3 berths. NTPC should explain in the DEX the purpose of the larger easement and the cumulative impact involved. The larger easement is alluded to on page 7-8, section 7-9, 1st paragraph.

㊽ Sec. 6.3; Page 6-4; Col. 1, para. 5.
Deficiency: In section 6, page 4, 3rd paragraph under Tanker Unloading Facilities, is a statement saying there will be 511 tanker port calls if the Puget Sound Refineries were served by NTPC pipeline.

Table 8.4.1.2-1, Section 8, Page 22 indicates the combined port calls to the existing risk refinery facilities in the Puget Sound area plus tankers coming to Port Angeles will be 908 port calls per year. Eliminating the tankers serving the refineries and having the oil go by pipeline will mean 908 port calls at Port Angeles, not 511, as stated in Section 6. Which is correct? 511 or 908 tankers per year at Port Angeles?

㊾ Section 7.9.1; Page 7-4.
Question: Berthing facilities would pre-empt other industrial uses such as log storage. Also, it may force the Coast Guard to relocate. What alternative sites are there for log rafting, Coast Guard, etc.?

㊿ Section 7.10; Page 7-4; Para. 1.
What plans are made to keep the continuity of the prestigious Port Angeles Salmon Club Derby intact, without interuption of its 42 year history? Are these plans, if any, promises, or hard, concrete propositions for the derby's uninterrupted continuance at a site capable of launching the numerous boats in the accepted manner, and accomodating the parking of the cars, boat trailers, RVs, trucks and campers attenuant in the fashion accustomed in the preceeding years on land? Will the plans accomodate not only the launching of these boats, but the salt water mooring of some 200 small craft as is now currently practiced during the derby? If these plans are not formulated, and concrete, why not? It must be realized that the Port Angeles Salmon Club land lease on Ediz Hook also accomodates the following recreational fishing extravaganzas: 1. The internationally known American Legion kid's salmon derby (any child under 16 years old - boy or girl - fishes free from donated boats, gas, time, gear and food. 2. The illustrious, fun loving Elks derby. 3. The same category for the Eagles annual derby. 4. The Pen Ply salmon derby. 5. The handicapped people's salmon derby. 6. The long continuing Port Angeles Yacht Club fishing derby in early spring. 7. The smaller, local organizations salmon derbies to numerous to mention. Are these Port Angeles Salmon Club's well known facilities to be located on the Port Angeles harbor as have been accustomed and accepted by United States and international fraternity of salmon fishermen? If not, where does NTPC plan to locate such facilities, when, and how?

CONT

(51) Section 8.1; Page 8-3.
Deficiency/Question: It appears that minimum facilities would be displaced by locating the oil port at one of the alternate sites of Freshwater Bay or Low Point. The ES does not discuss advantages of placing the oil port in Port Angeles Harbor over the alternate sites. Why was Port Angeles Harbor selected over these sites? The reasons are not clear in the ES to the layman.

(52) Section 3.1.13; Page 3-46; Column 1, Paragraph 1.
Deficiency: The brief discussion of the impact on the USCG base is very inadequate. What are the consequences of displacing all or part of current Coast Guard operations on the spit? Recent 3/79 NTPC amendment to place berths further out on Hook is not discussed in the DES, nor was it of common knowledge prior to the public hearings.

(53) Section 3.1.13; Page 3-46; Column 1.
The DES makes the judgment that increased electric loads would not be significant during the construction phase. Please document this judgment.

M

LAND USE

① Clallam County has added specific language to its Comprehensive Plan banning major oil facilities, refineries and petrochemical plants anyplace in the county. This language is also proposed in its revised Comprehensive Plan. Table 1.5-1 should include Clallam County.

② Section 2.1.2.12; Pages 2-125, 3-40, 3-104, 8-43, (CFR, 1500.8).
Deficiency: Under land use and zoning the BLM states that it is EFSEC's responsibility to determine conformance or conflict of the pipeline with the County Shorelines Management Master Program. The above CFR requires the BLM to address this matter in the EIS.

③ Page 3-40; Column 2; Paragraph 3.
Deficiency: The statement is in conflict with city comprehensive plan to retain Ediz Hook public access and enlarge and improve recreational areas as they become available on Ediz Hook.

④ Page 3-54; Column 2; Paragraphs 1 and 2 and Page 3-55; Column 2.
Error: Paragraphs 1, 2 and 3 are erroneous and deficient. The Northern Tier project is incompatible with current land and water useage as it displaces existing industry and recreational facilities to relocation areas for 20 year project lifespan. Electrical power shortages compounded by Northern Tier project could result in worker layoffs and curtailment of current industrial expansion or new industries. Air quality degradation could have similar and added adverse impacts. These realities (not fears) have been spoken to on pages 3-51 and 3-46 of this DES), resulting in lowered profits for the mills and economic impacts for workers.

⑤ Deficiency: Both the City of Port Angeles and the County ban an oilport in their comprehensive plans based on public hearings and a public vote (City of Port Angeles).

⑥ Page 3-104.
Error: Draft Environmental Impact Statement says " . . . the Energy Facilities Site Evaluation Council has determined that pipeline system construction would be consistent with state and local planning and zoning." The tank farm is incompatible with the current Clallam County Comprehensive Paln as stated in the Description Section of the DES.

⑦ Page 1-10.
Deficiency: How much bunker fuel barge or tanker traffic will exist during maximum operation? If on-shore bunker fuel storage tanks are proposed the DES should be amended to include all appropriate information.

⑧ Page 1-28.
Deficiency: The photograph is not representative of what a typical plant with a 42-48 inch line will look like. This misrepresents the projects relative size and the amounts of land such a plant would require.

Page 1-42.
Deficiency: The photograph is not representative of the impacts covered by the placing of a corridor through a forest with crawler-dozers.

Page 1-43; Figure 1.4-11.
Deficiency: Artists concept shows a nice flat, cleared area where vehicles and activities have relatively little impact on any resources. This presents a misleading impression of pipeline laying for the reviewer of the document.

⑨ Section 2.1.1.12; Page 2-30.
Deficiency: The specific usage of land within 2000 feet of the tank farm should be described in detail. Table 2.1.1.12-2 reflects Clallam County land usage as of 1971. This information is 8 years old and the County has increased in population by over 25% in that period.

⑩ The last paragraph on the page lacks a discussion (required by 1500.8(a)(1) CFR) on how the proposed action conflicts with the specific terms of the County Shorelines Management Program. The wording on page 2-30 indicates only that the submarine line conflicts with regulations of the shoreline program.

⑪ Section 2.1.1.12; Page 2-31.
Deficiency: The map on page 2-31 is too vague. One could not get an accurate idea regarding land usage near NTPC facilities, especially the tank farm area. Much of the area shown as forest land is presently rural residential homesites especially in the Green Point vacinity.

⑫ Page 2-44.
Amenities: Ediz Hook is an important amenity for leisure time 300,000 days a year.

⑬ Section 2.1.1.12; Page 2-115.
Omission: The third paragraph of segment 1 omits the Dungeness River. The fourth paragraph states that this segment has a high scenic quality (A/B). The second paragraph on page 2-115 indicates that an A/B rating is a "moderate to high scenic quality." Therefore, if segment 1 is a "high quality" (moderate excluded) segment 1 should be rated A.

⑭ Section 2.1.2.12; Page 2-118.
Omission: The description of land uses along the pipeline route totally ignores an important catagory of usage-rural residential. The pipeline passes through considerable rural residential areas in Clallam County. Table 2.1.2.12-1, on page 2-118 also has the same omission.

⑮ Section 2.2.2.12; Page 2-162.
First paragraph omits Sequim. Also, this paragraph is so general that it is meaningless. More specificity is appropriate.

CONT

⑯ Page 3-11; column 1; paragraph 3.
The 140 acres only includes Phase I. Discussions should include Phase II.

⑰ Page 3-38.
The photograph with overlaid drawing of the cut in the bluff and the tank farm is very deceptive. Why are only 11 tanks shown when 25 may be built? Why are trees shown covering the site when 90% will be removed? Are the 285 foot diameter tanks rendered to scale?

Page 3-38 and 3-39.
Deficiency: Picture gives erroneous impact impression with only 11 out of 25 tanks in drawing pictured on page 38. If not familiar with agricultural/residential land use zoning and tremendous significant impact of 25 tanks each the size of a football field, viewer would not know scope and magnitude of impacts from total project. Picture looks as if tank farm will be hidden in forested area.

⑱ Page 3-39.
Error: States fewer than 20 residences are within 1,000 feet of proposed tank storage. Page 3-41 last paragraph in column 1 states fewer than a dozen residences would be within a distance of either 1500 or 1000 feet. Specific data should state residences now existing and current landowner plans for area encompassing an area much broader scope than this for impacted area.

⑲ Section introduction assumption #2 pertaining to the anticipated 20 year life cycle of the NTPC facility is not realistic. The assumption should be revised to reflect the history of usage of this type of facility including the pipeline. It is highly unlikely that the pipeline will be abandoned if it is in operable condition. Many other substances can be transported through a pipeline.

⑳ Page 3-40.
Deficiency: What would be specific size of forest buffer and location areas when total project complete?

㉑ Section 3.2.12; Page 3-103.
Omission: The section on agriculture should address how much agricultural land will be impacted by such ancillary improvements as maintenance and construction roads and power easements. Also the construction through agricultural land at the rate of one mile per day seems too unrealistic.

㉒ Section 3.2.13; Page 3-107.
Deficiency: Pipeline construction will necessitate construction of staging areas and pipe storage areas. The DES should identify the amount of land required for staging. These staging areas will generate noise, glare and dust nuisances for adjacent land owners and public road users. Slash piles will generate a fire hazard to adjacent woodlands.

㉓ Section 7.8.1; Page 7-3.
Deficiency: The wording of this section makes one wonder if the DES is reviving a two berth, 2 submarine line, 11 storage tank 709,000 BPD flow NTPC facility, or a 3 berth, 3 submarine line, 24 storage tank 1,283,000 BPD flow project. The DES should revise impacts of the latter if it is in NTPC plans to construct such a large facility in a reasonable future period.

㉔ Page 2-31; Map.
Deficiency: No designation for recreational use of Harbor: boat marina, civic peer, public beach, shrimping, boat launches, etc. Industrial and commercial uses are not synonymous. Land use plans nearly always make a clear distinction yet there is no distinction on this map. The entire southern harbor is not exclusively industrial.

㉕ Page 2-155.
Deficiency: Land use (storage facility site) — does not mention existing level of residential activity in vicinity: the number of plats approved for residential development.

㉖ Page 5-7.
Deficiency: Smog is not mentioned under Visual Resource.

㉗ Section 3.1.11; Visual Resources: Summary
Construction of the onshore storage facility at Green Point with clearcutting of 292 acres and construction of up to 23 tanks 285 feet in diameter and 56 feet high will be a major visual intrusion not moderate or low and will impact not just nearby residents but will be a visual intrusion dominating the scenery. It will be visible from the Straits of Juan de Fuca and from the Hurricane Ridge Road and perhaps from Highway 101.

Page 3-37; Column 1; Paragraph 1, and Column 2.
Deficiency: What economic impact would the highly visual degradation of Green Point have on current zoned residential/agricultural real estate values and future residential development in the Green Point area?

Deficiency: This section does not identify and address visual resource negative impacts as related to residential passive viewing as it effects view property, real estate values and sales. Also commercial real estate such as restaurants, motels and apartments.

Deficiency: Does not identify impacts related to current efforts of downtown merchants to update and improve visual atmosphere of downtown business community.

Deficiency: Does not identify impacts related to City Pier Project in progress and dependent upon retention of visual aesthetics of waterfront and Ediz Hook area.

Section 3.1.11; Page 3-37
Question: It is stated that the Green Point tank farm would be highly visible to residents and tourists. From how many locations would the farm be visible? From Dungeness Spit? From the Hurricane Ridge road? From the Straits? From Ediz Hook? From British Columbia?

㉘ Page 3-39; Column 2; Paragraph 7.
Error: Residential area and business area including Olympic Memorial Hospital could be impacted by noise, traffic and dust impacts. Residential and Business areas are not scattered either to the East or West but concentrated on harbor rim and harbor area, including restuarants and motels.

㉙ Section 4.12; Page 5-2.
Deficiency: The section on visibility should include an analysis of the tank farm separate from the unloading facility.

㉚ Page 3-40.
Error: The last sentence in the fifth paragraph is in error. The secondary effects of the tank farm are not explored. The presence of the tank farm may generate vigorous land speculation in the area. Tank farm workers will want to live near the tank farm in order to minimize energy costs of commuting. The air pollution from the farm will probably not significantly affect adjacent land up wind of the farm (south and west) and therefore additional development will take place in this area. Also, commercial uses will proliferate south of the area on the Old Olympic Highway and U. S. 101. The air pollution will devalue property down wind (east) from the farm. If it is severe enough it may cause displacement of residential and some commercial (tree nursery, Christmas tree farms, agricultural operations, etc.) land uses.

CONT

㉚ Note: the comments above also apply to the seventh paragraph on page 3-40.

㉛ Note: Land speculation is an adverse impact primarily because large amounts of land will likely be subdivided into lots which are manyfold more in number than the anticipated need to be generated by the NTPC facility. Therefore, the prematurely divided land which is not needed sits idle for tens of years not producing trees, fiber, food or residentially occupied space.

General comment: The DEIS does not adequately evaluate the impact of the facility on land values prior to and during construction. The anticipation of the project is likely to cause a rapid increase in the price of property. Speculation causes land to be purchased prematurely, often at very high prices and without regard to its suitability for development. Consequently, the price of adjacent land near the tank farm is forced up and many landowners may find themselves unable to pay the increased taxes on undeveloped property. Landowners living on the land may be forced to sell off the property due to the high taxes. However, this speculation near the project will trickle over to other property in the community forcing land costs up for everyone affecting especially low income and fixed income citizens.

㉜ Table 3.1.12-1; Page 3-40; Column 1.
Question: Has same deficiencies as related narrative and speaks only to two berths not total project. Addressing the Green Point area, the DES states project would use property which would have negligible impact in terms of undeveloped property in area. This is questionable based on use of residential/agricultural zoned land for industry with resultant significant impact to quality of life for current users and landowners and restraints to future development not only in initial construction phase but when impacted by total project. Also in relation to property devaluation from same, and problems related to electrical, water, services unavailability and increased costs.

㉝ Page 3-40; Paragraph 5.
Comment: Statement implies that industrial development would not set precedent for rezoning and increased industrialization. Ocean view homes will probably not desire to build adjacent to oil tanks and industry so the land will lose residential value. Secondary impacts should be evaluated and discussed.

㉞ Section 3.1.12; Page 3-39, 3-40 and 7-4.
The fifth paragraph, fourth line of page 3-40 is deficient and in error. Tank farm facilities and associated pipelines attract related energy facilities. This paragraph should identify the potential for related energy facilities to locate near a terminal facility such as the one proposed by NTPC. The same sentence cited above stated that no other industries would locate near the tank farm. This statement should be expanded to address the precedent setting effect of locating a high intensity use in an area which has never had such a use. The services and facilities necessary to serve the tank farm may attract other higher intensive industrial or commercial uses.

㉟ Page 3-58.
Statement: "Additional petroleum-based industry is unlikely."

Page 6-2.
Statement: "The location of Port Angeles is economically not conducive for the development of refineries or petrochemical plants."

This constituted the discussion of this issue and is grossly inadequate. In addition, it is probable both statements are ill founded. In fact, a Task Force member was perplexed by the conclusory nature of these statements and called the Portland Office and spoke to the BLM team member who was responsible for this judgment. He could not cite a specific reference upon which this judgment was based. It was the product of the EIS team's personal judgment.

By contrast, another Federal EIS on another deepwater oil port facility--the final EIS on the LOOP Deepwater Port License Application found that EIS devoted five separate sections plus 62 pages in the Appendix to the issue of secondary development. These were some of the findings:

> Historically, refining capacity has tended to locate where crude is. A correlation analysis between refining capacity and crude oil production for Louisiana revealed that the co-efficient of correlation was .89." (or 89%)
>
> As domestic oil production in PAD III declines, new refinery growth will have to depend on foreign crude and will tend to be built where foreign crude oils can be most readily obtained, i.e. in the coastal region. Refineries will also tend to locate on the coast to allow ready access to pipeline networks and tanker transportation systems which deliver products to markets outside PAD III. Another minor reason for locating on the coast is that a refinery uses a part of its crude oil supply (often 3-5%) as fuel to run the refinery. Moving crude a long way thus increases the cost of refinery fuel, and given the opportunity a refiner will minimize such costs. (C-96)

We consider this an important issue. The U.S. Department of Transportation seemed to consider this an important issue in the development of the EIS on the LOOP deepwater port facility. Yet, BLM has not responded to public input on this matter. Clallam County is on record as early as June 2, 1977, (nearly 2 years ago) requesting that this be given due consideration by the EIS team. Clallam County reiterated that concern again on January 10, 1978. It was verbally reiterated at three meetings of the BLM Coordinating Committee by the then Chairman of the Board of Clallam County Commissioners.

This is a proper concern of local government and one that NEPA requires a lead agency to fully examine. A publication by the United States Coast Guard entitled: Guide to Preparation of Environmental Analysis for Deepwater Ports acknowledges this obligation as well. We would like to quote it:

> Since the construction of a deepwater port is likely to entail many second order and higher order costs and benefits (such as the effect of terminal associated refining and petrochemical activity, and the indirect effects of this activity), and since they may be very large, the applicant should discuss them thoroughly. (6-5)

The LOOP EIS further states:

> The development pressures stemming from petroleum-related industrial growth. . . will create a need for major new public expenditures. For example, about $3 billion will be required for new schools, utilities, street and roads and other public facilities by 2000-2010. LOOP-related activities will contribute to these needs.
>
> This situation has the potential for adversely affecting the operation of local governments in the Corridor for significant periods over the next 35 years. . . A number of local governments will be hard pressed to fund new facilities and services during these times. (5-11)

CONT

㉟ Industry sources have estimated that U.S. consumer product needs will require 17 new refineries before the year 1990. A recent article in the Seattle Post Intelligencer (March 12, 1979) reaffirmed similar estimates. It is the apparent consensus of government, congressional and oil industry energy experts that, contrary to popular belief, the current petroleum shortage is not due to the Iranian cutoff. Rather, it is the lack of U. S. refinery capacity--not the loss of Iranian oil--which is responsible for the shortfall.

Where will these new refineries locate? They have historically located where the crude oil is, not where the market is. A good example of this is, again, the Gulf Coast. Approximately 53% of all products refined along the Gulf Coast is shipped out of that region. (C-84) The two largest product pipeline systems in the United States originate in the Gulf region. One extends from Baton Rouge, Louisiana to the Washington D. C. area and the other extends from Texas to the New York/New Jersey area. Transit time of a product barrel is approximately 12 days from Houston to New York. (C-84) By comparison, then, the Olympic Peninsula is by no means an unrealistic location for a refinery with access to the entire West Coast product market via both waterborne vessel or by pipeline connection with the Olympic Product Pipeline System.

This is not a condition endemic to the Gulf Coast. A similar scenario is occurring in the State of Alaska. During 1977-1978, eleven different proposals were submitted to the Alaska Oil and Gas Royalty Board for new refineries. (OGJ 9-26-77) A refinery will be sited at Valdez. The same thing could occur at Port Angeles. If Port Angeles becomes the site of the country's largest onshore crude oil terminal, as is proposed for this project, then Port Angeles is an equally likely candidate for refinery development.

A key element of the U.S. Corps of Army Engineers West Coast Deepwater Port study was the likelihood of refineries locating in the vicinity of a new deepwater port. In fact, each port site the Corps considered, including Port Angeles, was evaluated in terms of the feasibility of that Port site for refinery development. Port Angeles was a feasible location.

According to the U.S. DOE's recently released petroleum supply alternatives for the northern tier and inland states: the State of Washington can expect an increase in refinery output of over 200,000 b/d by the year 2000. That is the equivalent of two new refineries.

On January 22 of this year, it was announced that American Petrofining plans to locate a 250,000 b/d refinery in Western Washington. The Port Angeles area is a candidate site.

In summary the BLM has not fulfilled its responsibilities under NEPA to fully examine secondary development as a logical consequence of a major crude oil terminal at Port Angeles.

Also see: Offshore Petroleum Transportation System for Washington State, Feasability Study OCW page IV 157 last paragraph and page 158 first paragraph.

㊱ Page 1-44.
Deficiency: More information should be given on the coordination of pipeline construction activities with other utilities to assure that an existing utility is not inadvertantly severed. Also, the DES should identify the potential for severing and existing utility by pipeline construction.

㊲ Section 3.2.12; Page 3-105 and 3-106.
These sections do not adequately detail the land use impacts of the pipeline. The pipeline corridor often attracts undesirable recreation activity (ex., promiscuous shooting, vandalism, trespass, sabotoge, poisonous weeds in Western Washington). Maintenance roads generate subdivision activity. The pipeline splits wooded and agricultural ownerships creating land management problems. Some ownerships are intersected in a fashion which creates small slivers of land which cannot be managed for any use. Uncontroled recreation uses create problems such as erosion, vandalism, fire protection, etc.

Section 7.9.1; Page 7-4.
Deficiency: If the berthing facility will intrude on Coast Guard Station, the DES should be more specific about the impacts and the specific NTPC facility that will intrude. This and related concerns are addressed in the "Harbor Management" section of this report.

The DES does not adequately describe the impacts of the pipeline construction on the movement of groundwater. The movement of groundwater or alteration of its movement needs to be carefully analyzed prior to approval and construction of the project. This and related concerns are further addressed in the "Water Quality" section of this report.

㊳ Page 1-16.
Deficiency: What is the sabotoge potential on the tank farm given the extent of the described security system?

㊴ Deficiency: The influx of construction workers and facility operators will generate demands for additional housing which in turn will generate an administration cost to County and City governments. This cost arises when City and County planning staffs are overwhelmed with processing project proposals submitted by developers. Both public agencies may need to employ additional personnel in order to process the projects in sufficient time to meet the new housing demand as well as processing other projects which are attracted by this new growth. The statement should specify how much timber land in each county of Western Washington will be lost due to the construction of the project. Include amount of board feet lost over an 80 year harvest cycle.

㊵ Page 3-39; Column 1; Number 3.
Error: It is an error to state current adjoining land uses are incompatible with the project. Northern Tier's total project is incompatible with current land uses, and necessitates relocation, curtailment and restriction on future industrial, residential, commercial, and recreational land uses.

㊶ Page 3-39; Column 1, Abandonment under 1.
Question: No basis for assumption project facilities will be dismantled. Not specifically stated in project description. What measures will be taken to protect city and county from unknown impact at any stage of project termination which could result from conversion of project site and components into further industrial usage.

㊷ Page 3-39; Column 1.
Deficiency: Project does not speak to total project impacts relating to construction and operation with ongoing construction and increased operational risks and impacts within five years from initial construction phase.

㊸ Page 3-39; Paragraph 6 above column 2.
Deficiency: Does not consider current expansion plans for industrial, recreational and Coast Guard uses and impacts on same. Also impacts to other land users such as Merrill and Ring during construction and especially with harbor entrance access restricted for months. (Volume 3, part 2, Site Certification Northern Tier Pipeline, page 2.10-3)

CONT

㊹ Page 8-29.
Question: Where would onshore storage be located at Freshwater Bay? How much acreage would be required? Page 8-31 notes 140 acres, Page 8-37 notes 294 acres, Page 8-42 notes 150 acres clearcut and 150 acres fenced (total 300 acres).

㊺ Section 2.2.1.2; Page 2-154.
Question: What is the basis of the population projection set forth on the second paragraph of this section.

Section 2.2.2.15; Page 2-164.
Error: The population projections for Clallam County on Table 2.2.2.15-1 are already proven to be conservative estimates as verified by population estimates from the State to April of 1978. For example, the 1980 estimate is 44,000. The County reached that figure in early 1978.

㊻ Section 3.1.12; Page 3-52.
Question: The mobile homes projected to be used by transient construction workers will probably be located in the unincorporated area because of the cheaper land and lack of zoning as compared to the City of Port Angeles. Also, construction camps will be located in the unincorporated area because such camps would not be allowed by city zoning. Also, the escalation of rents due to construction activity will undoubtedly displace low and marginal income families to areas which allow for cheaper housing which may be in the unincorporated areas near County roads. Rural land owners would rent their property at cheaper rates than in the City and thereby attract low income mobile home placements.

㊼ Page 3-54; Column 1.
Deficiency: What effect would housing rental increases of between 20 to 25% have on community service demands from Washington State Department of Social and Health Services during the 22 month minimum construction period and returning again in the other construction periods? Relating to low income and fixed income people?

㊽ Section 6.3; Page 6-3.
Omission: Information should be given regarding the compatibility of the tank farm location to the intent and purpose of the Magnuson Amendment.

㊾ ection 3.1; Page 3-54 and 7-4.
Error: Last two paragraphs on the page identify the views of some other persons other than the author/applicant. This type of wording is interspersed throughout the statement. This type of wording does not belong in the statement unless the applicant/author agrees that this is a impact(s) worth exploring. In other words there should be no reference to what other persons think unless the person is an objective expert in the field and worth quoting.

㊿ Section 4.9: Page 4-4; Paragraph 2.
Omission: Reportedly, in presentation of biological data the U. S. Fish and Wildlife Service has indicated that Green Point is an unacceptable site for a storage tank facility because of the nature and severity of the anticipated losses that could not be mitigated.

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## LAW ENFORCEMENT

Law enforcement is a vital concern and if an oilport is located in Port Angeles, it will undoubtably require an increase in police services and other areas of the criminal justice system. There is great difficulty in assessing our needs because it is difficult to determine how fast a build-up of personnel related to all aspects of the oilport project will occur and there is no way of determining the composition of the work force. The questions that need to be answered are numerous when looking at the oilport issue and its effects on police service. The impact questions will be listed under two headings, direct impacts and secondary impacts.

① DIRECT IMPACTS: It is difficult at best to estimate the number of people that will move to Port Angeles and Clallam County as a result of the initial construction period. Are we talking about 2,000 people, a lot more, or much less? What kind of people will be moving to the area? Will they be more involved in criminal activity than someone that is an established resident, i.e. fights, vandalism and other alcohol related incidents? What will be the increase of vehicular accidents due to increased traffic from construction vehicles, workers vehicles, and their families vehicles? How much will tourist traffic increase? How much more routine police traffic patrol will be needed to handle the above stated traffic problems? How much impact will there be on the police department's parking enforcement program in the downtown area?
With the influx of a large number of transient workers will prostitution become a problem? Will bad checks become a major problem? Will family fights become a problem? How much other, not mentioned, criminal activity will crop up? Another thing that comes with rather large numbers of people are their pets. How much impact will there be on animal control? How much security type patrol will be needed in the construction area?

After the manpower figure is developed what will be the cost of equipment including vehicles needed to supply not only the police officer on the street, but the investigators needed for follow up work and the clerks needed to handle the paperwork generated?

② With only an 18 month job in mind, what quality of recruit police officers would we get? With the need, under state law, to send all newly hired officers to basic law enforcement school, within 15 months of their date of hire, would this mean we would have to hire more officers than actually needed because of the loss of officers to basic training?

③ SECONDARY IMPACTS: After the initial construction period ends, and the number of employees hired by the oilport construction firm drops off, how many of the people will stay in the area and go on our unemployed roles? Would these persons also become a law enforcement problem? After the pier or docking facilities are completed, what kind of problems will the ships crews be? What kind of manpower needs would develop from the responsibilities of guarding the pier from vandalism and possible sabotage? Would there be a need for a police harbor patrol boat to supplement the Coast Guard's responsiblity?

④ One of the major secondary impacts would be determining what to do with the extra police officers and other police personnel after the initial construction period is over. They were needed for that approximate 18 months, but may not be later on.

CONT

Beyond question an oilport industry locating in Port Angeles and Clallam County will increase the demand for police services. Added responsibilities of protecting people and property will require an increase in personnel to cope with the demand. The following areas of concern should be addressed in the DES, regarding impacts on the Port Angeles Police Department.

During the Construction Period:

⑤ 1. Traffic increase in volume to and from the Ediz Hook site will be significant. All materials and construction workers will be in direct competition and conlfict with existing industry west of the downtown area to the construction site unless moved via water to air. Bottlenecks due to physical layout of the streets (such as the area through the Crown Zellerbach mill) as well as those created by shift changes at Crown Z or M & R Timber Company mill are seen as major accident causing factors that will require the constant attention of law enforcement officers.

⑥ 2. The influx of construction workers will increase the volume of activity in areas of housing, in restaurants and recreation facilities, and in drinking establishments. All of these factors will mean an increase in the volume of incidents such as fights, vandalism, assault, disorderly conduct, family beefs, both major and minor crime.

⑦ 3. Parking will be effected by the influx of construction workers particularly where it conflicts with the fishermen parking on Ediz Hook. Parking has been a problem for several years on Ediz Hook due only to the volume of fishermen without the confusion of a large construction project.

⑧ 4. The stockpiling of construction material and equipment will be a major concern during construction due to its being a potential target for sabotage, vandalism and theft. A major construction company has been active on Ediz Hook in recent years on a project very favorable to the vast majority of the populace. Vandalism to their equipment was frequent and costly until fairly expensive and extensive steps were taken. We can visualize any oilport construction as being many times more significant due to the project being as unpopular as it is.

During the Operation Period:

The people who will man and operate the oilport physical plant, related tug and service vessels, security people, maintenance people and others who will be permanently located in Port Angeles and Clallam County will increase our population. A fair percentage of the tanker crews who will be traveling between Valdez, Alaska and Port Angeles as a regular routine run will surely select Port Angeles as their home port.

⑨ Somewhere we have been supplied a figure of 30 to 45 tankers per month discharging oil in Port Angeles. Conservatively this number of ships will have between 500 and 700 crewmen who would likely locate in our community. If each crewman has a family of three we are seeing between 1500 and 2100 people added to our responsibilities. This number of people would generate a consdierable number of new housing units, new businesses, new utilities and services, all of which become a concern of law enforcement in the protection of life, limb, and property.

Our ratio of law enforcment officers to population at present is considerably below the state and national averages. Our support service employee numbers are about average considering the broad areas of responsibility in addition to the regular and usual operations of a police service of our size. The people of our community deserve police protection equal the average level in our state.

⑩ In the event of any type of disaster related to an oilport be it an extensive oil spill, fire, or explosion, there would be added responsibilities of the protection of life and property for law enforcement. Depending on the type of emergency created, there would always be traffic control problems for emergency vehicles and crews to a greater or lesser degree. Our hope is that there would be built-in safeguards to prevent any type of emergency, but are realistic enough to realize that nothing is 100% foolproof and the possibility will exist.

⑪ Any updating requiring an increase in personnel will place a financial burden on the community.

Our budget will have to be increased to meet the demand roughly as follows based on 1979 figures:

General Needs:

| | | |
|---|---|---|
| 5 Police patrolmen | Salary | $82,320.00 |
| | Benefits | 12,105.00 |
| | Equipment | 2,750.00 |
| | Training | 25,000.00 |
| 4 Vehicles | | 32,000.000 |
| | Vehicle equip. (Radios,etc.) | 7,500.00 |
| | Vehicle rent/ Maintenance | 31,920.00 |
| 2 Clerks/Dispatchers | | 20,016.00 |
| | Benefits | 6,652.00 |
| | Training | 920.00 |
| | | $221,183.00 |

Determining the need of a harbor patrol boat at this point in time with the information available is an uncertain shot in the dark. The need for vessel traffic control, enforcement of boat safety laws, search and rescue, and related water activity is traditionally in the jurisdiction of the U.S. Coast Guard with few minor exceptions. Should the U.S. Coast Guard Air Station and the locally based vessels be removed from the area then there will be a positive need for an adequately manned vessel. The vessel will have to be equipped with all necessary search and rescue, as well as, law enforcement materials and manned 24 hours per day, 365 days per year.

A conservative estimate of cost for such a vessel with related equipment would be in the neighborhood of $250,000.00 and be much like the vessels owned and operated by the Puget Sound Pilot Association.

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CONT

⑪ A minimal crew would be three officers to operate the vessel and its equipment. A three man crew would require 15 officers be added to a harbor patrol division.

At 1979 Salary Level:

| | | |
|---|---|---|
| 15 Officers | | $246,960.00 |
| | Benefits | 36,315.00 |
| | Equipment | 8,250.00 |
| | Training | 75,000.00 |
| | Total budget increase with vessel-- | $616,525.00 |

Jail costs are an unknown factor at the present as hopefully the new Clallam County Jail will be in operation in 1980 with all city prisoners housed there via contract. The contract likely will call for about $20.00 per day per prisoner.

Not addressed thus far in this update is the present physical facility which is small and cramped to capacity. Added personnel will require remodeling and expanding the present police building at a considerable cost.

We have not addressed other budget factors relative to added salary for supervisors and administrative services, moorage fees for harbor patrol, fuel and maintenance for the harbor patrol, etc.

The ultimate result of this update indicates that the police department would conceivably be doubled in numbers, expanded physically, add a harbor division and more than double the annual budget. There is no reasonable way that the present people of the community should shoulder the burden for the entire costs and still lose the tranquility and lifestyle enjoyed currently.

Total costs would exceed a million dollars should a harbor division be needed and around a half a million without.

The following areas of concern should be addressed in the Environmental Statement, regarding impacts upon the Clallam County Sheriff's Department.

Considerations during construction phase:

a. Population increase (The projected population data utilized herein has been generated by the BLM. Local governments have established that these figures may be conservative by one-half).

| | | |
|---|---|---|
| 1. Increase: | Expected monthly average - Northern Tier | 573 |
| 2. Increase: | Service and supporting industries | 50 |
| | | 623 |

Result: Increase in population will result in an increase in incident rate requiring the response of law enforcement officers.

b. Traffic increase

1. Construction traffic - Construction traffic affecting the Clallam County Sheriff's Office (CCSO) is expected to be primarily confined to the eastern area of Clallam County with most of the activity on the feeder roads leading to the Green Point construction site.
2. Personal vehicles - Increase in traffic caused by the increase in privately owned vehicles is expected to be primarily confined to the Port Angeles area with peak increases in traffic during shift changes at construction sites.
3. Ship and barge traffic - The increase in ship and barge traffic related to construction is not expected to have a significant effect on the CCSO work load.

Result: Increase in construction and privately owned vehicle traffic will result in an increase in the accident rate, requiring the response of Law Enforcement officers and emergency vehicles.

c. Vandalism and sabotage

1. Construction equipment and vehicles
Construction equipment and vehicles often present an easy target for vandals and sabotage.
2. Construction site
Construction sites at both Green Point and Ediz Hook will offer targets for vandalism and sabotage activities.
3. Construction supplies
Construction supplies will also offer a target for vandalism and sabotage.

Result: Although Northern Tier will provide security personnel during the construction phase, there will be an increase in vandalism requiring the response of Law Enforcement officers.

Sabotage is not expected. However, should it occur, there will be a significant increase in related law enforcement requirements.

d. Thefts

Construction equipment, construction vehicles and construction sites offer relatively accessible targets for theft.

Result: Although Northern Tier is committed to providing security personnel during the construction phase and the operational phase, we can expect an increase in the theft rate in Clallam County.

CONT

Considerations during operational phase:

a. Population increase (Conservative estimate):

| | | |
|---|---|---|
| 1. | Increase due to NT employees and families | 150 |
| 2. | Increase due to service related industries | 100 |
| 3. | Tanker crews<br>Increase caused by relocation of US tanker crew families to Port Angeles | 100 |
| 4. | Tanker crews shore leave<br>Average daily influx | 35 |
| | | 385 |

Result: Crime incident rate will increase.

c. Sabotage and vandalism

Although NT will provide site security and pipeline patrol, we can expect an increase in the vandalism rate caused by the relatively accessible targets and the ill feeling toward NT by a segment of the local population. Internationally motivated sabotage is not expected.

Result: Vandalism rate will increase.

d. Explosive potential

The explosive potential of crude oil is relatively low. Gasses accumulating near the surface of crude oil produce the greatest hazard. Floating storage tank covers assist in decreasing the danger.

Result: Risk of explosion is always present.

e. Oil spills

Although the probability of a major oil spill occurring within the Port Angeles harbor or near Port Angeles is relatively small, the CCSO must take this possibility into consideration. Should a major spill occur the work load of the CCSO will increase dramatically.

Result: Covered in other statements.

f. Ill feelings

Northern Tier's Oil Port facility at Port Angeles will generate a significant amount of ill feelings toward NT and their employees by a segment of the local population. This ill feeling can be expected to result in an increase in incidents, i.e. assaults, all requiring the response of Law Enforcement officers.

Result: Increase in incidents requiring the response of law enforcement officers.

⑫ Resume: The largest impact on the CCSO caused by Northern Tier's Oil Port facility will be felt in the eastern area of the county. The increase in the accident and traffic rate will be significant and these increases will require additional man power in the CCSO. The addition of two field deputies should prove adequate to cope with the expected increase in the CCSO work load. Two additional field deputies should commence their employment at the CCSO when the construction phase of the Oil Port facilities commences. Additional requirements can be met by hiring reserve officers on a temporary basis.

Cost estimate:

| | |
|---|---|
| Extra help (reserve deputies) during construction phase | $15,000 |
| Two field deputies (includes prorated vehicle costs, gas, oil, uniforms, wages, benefits, etc.) | 55,000 |
| Additional administrative costs | 5,000 |
| Additional confinement/detention facility costs | 5,000 |
| | 80,000 |

Estimate of yearly cost during construction period. $80,000.

Estimate of yearly cost during operational period. $70,000.
Note: Additional extra help decreased to $5,000

The office facilities available to the East End detachment of the Sheriff's office should be increased.

⑬ The Environmental Impact Statement is very deficient in its discussion of law enforcement related impacts. This is most apparent in the lack of consideration of the need for additional support needed by the Sequim Police Department, particularly in light of the recent announcement that the pipeline route will become submarine from the vicinity of Port Williams.

How large will the population increase be as a result of the NTPC amending its application to utilize the "cross-Sound" pipeline route?

⑭ Will the pipeline construction staging areas, formerly planned for the Discovery Bay area, now be located near Sequim? At exactly what location will the staging area be placed?

How long will the staging area be in operation?

To meet reasonable standards for law enforcement the Sequim Police Department will need additional personnel and equipment. Normal patrols will have to be increased. Traffic control personnel and equipment will need to be increased considerably. The Sequim Police Department office and jail facilities may have to be expanded.

⑮ p. 5-21.
Omission: Table 5.2.15-1 Impact of operation -- does not mention the problems of security sabotage, fire evacuation, explosion recovery, and vandalism.

The Environmental Statement should include planning to cover security of all facilities during both construction and operation.

The Trans-Alaska Pipeline and other pipeline project experiences should justify the inclusion of sabotage-prevention plans.

CONT

⑯ Planning to minimize vandalism should be addressed.

p. 3-53.
Deficiency: Does not address economic impact on community related to taxpayer dollars needed for all Police Department operation costs during construction. Does not address lack of trained personnel to protect community.

Deficiency: Does not address types of disasters and impacts on police related thereto which could be induced by Northern Tier's operation.

Deficiency: No specific abandonment procedure is identified. Imperative this be specifically stated as it could occur any time prior to 20 year project life expectancy.

Comment: The DES should have discussed the incremental growth which the project (primarily in its construction phase) will cause in the entire criminal justice system. For example, will there be a need for additional judges, probation officers, clerks, Deputy Prosecuting Attorneys, secretaries, etc.?

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MEDICAL

① Table 2.1.2.15-1.
Deficiency: Social and Economic Conditions: It is misleading to simply list Clallam County as having two hospitals since one is over 60 miles away, to the west, in Forks (See table 2.1.2.15-1)

Medical services: It should be noted that the hospital site almost at the entrance to the harbor about 8000 feet from the tanker berth and is therefore vulnerable to both fire and explosion. If it is incapacitated the next nearest hospital is at Port Townsend 46 miles away over narrow winding roads. The community has very limited capacity to transport injured people. The number of ambulances should be given. A mitigating measure to be considered in light of expected explosion in the harbor every 4.6 years would be to relocate the hospital in a safer place or to make it explosion and fireproof with added noise barriers and air pollution equipment to protect it from these adverse effects as well.

② Sec. 3.1.2-1.
Omission: Emissions from construction 3.1.2-1: Should be given for the full project. Noise levels and hours should be given with reference to proximity of the hospital and residences. Although the state exempts construction noise from most of its standards, these standards should be cited to give evaluation comparability levels. The duration of emissions and maximum concentrations should be given from the the project's air pollutants at the project boundary and at Olympic Memorial Hospital, and at the nearest residence to the tank farm site. For particulates a 24 hour average would be adequate, but for oxidants, sulfur oxides and nitrogen oxides five minute and one hour maximums should be stated and for hydrocarbons a one hour; and a three hour average should be included. There are hydrocarbon sensitive persons and a one hour concentration would be able to affect their brain function. If air pollution values are to be excessive at one or more residences a mitigating measure might be re-location during the period of high emissions. With the fire and explosion hazard, relocation of the hospital would be one mitigating measure; or, alternatively, provision of fire and explosion proofing of the building. The hospital might also require air conditioning to control air pollution to hospital-safe standards.

Sec. 1.4.
Deficiency: How many pumping stations will be needed for 1.283 million bpd? Do they run through the night? Describe noise shielding to be used and maximum noise at the property fence for each station both for the project and for current background levels. How many residences will be affected by being able to hear each of the pumping stations?

Very inadequate mitigation discussion related to noise impacts. EPA permit process should require much more mitigation, in the case BLM does not adequately provide for this.

③ The immediate impacts of construction upon Port Angeles and the harobr are of concern. The economic well-being of Port Angeles may be affected if the oil port has a detrimental effect on the mills and tourist industry. Possibly the biggest concern is the long-range sociological change that will occur in Port Angeles as a result of this project. The DES fails to discuss the present and foreseeable levels of mental distress suffered by some residents of the Clallam County area as a result of the project.

Omission: The U. S. Public Health Services and the State of Washington Department of Social and Health Services should have provided evaluations of many of the technical aspects and impacts of the NTPC proposal for inclusion in the DES. Many of the aspects of the proposal are beyond the scope of local government capabilities to analyze.

④ Sec. 1.18.
Error: (1.18-5) Top paragraph -- incorrect to lump ophthalmologists and optometrists together. Optometrist is not a medical doctor and is not licensed to treat eye injuries or most diseases. He measures vision.

Sec. 1.18.
Deficiency: The DES does not address the explosion or major fire concept adequately. No plan or method of warning is included. Section 2-44 constitutes the major emergency situation with lack of manpower, equipment and time -- all three elements of a disaster. The second major problem would be the evacuation of areas from the lower section of the city and the areas along the bluff. Any explosion in the harbor will produce a shock wave which would have no resistance over water with the full effect along the shoreline into the central area. The Coast Guard Report, 16732/71895 notes that minor damage extends 3 to 6 miles from the explosion with the shock wave traveling overland. The 200 foot height of the bluff would have very little deterioration power of the wave and might reinforce it due to energy uplift from the surface front. A shock wave from Ediz Hook would extend into the atmosphere as far as it would extend in all directions from the center of the explosion. Therefore, a shock wave reaching the shoreline would be high enough to damage the structures on the bluff including the hospital and possible cause the chlorine at ITT-Rayonier to rupture.

CONT

⑤ DES should discuss project-related injury levels, based upon previous projects like the Trans-Alaska Pipeline System. This type of analysis will allow better planning by the medical facility administrators.

⑥ Page 3-53.
Deficiency: Does not speak to emergency treatment load for hospital nor to major accident or disaster related to construction phase.

Deficiency: Under police needs on page 3-57 it is stated traffic accidents will increase, as well as drunkenness, fights, and family disputes. Quantification of such accident rate increases should be offered by the BLM.

⑦ Sect. 3.1.15; P. 3-54.
Deficiency: This section briefly mentions higher levels of demands during construction for grocery stores, public offices, restaurants and public establishments. Public and private establishments would be crowded. Yet under medical services the DES states no significant demands would occur. This discussion of impact should be expanded, and mitigating measures addressed.

⑧ Sect. 3.1.12; P. 3-41.
Question: What quantity of OIL SPILL would be required to impact boundaries outside storage facility?

Sect. 3.1.12. P. 3-41.
Comment: Col. 2, para. 1. "Assumption" is not proper procedure description for abandonment procedures.

Sect. 3.1.12; P. 3-41.
Deficiency: Para. 1, page 3-39 states "Once a land use is displaced, it is unlikely that it will return to its original use". This is in conflict with statement in this paragraph 2, page 3-41.

⑨ Question: What redress will be made to occupants of residences near Green Point for noise disturbance in excess of Washington State noise standards during nighttime construction activities? This will last 8 to 12 months. Do any of the impacted residents have health problems such as heart disease, nervous or mental illness or high blood pressure which might be aggravated by the noise? What measures are planned to monitor this so suitable compensation for health effects can be made if warranted? What basic monitoring for these same health parameters will be made to either Green Point area or for residents impacted near the harbor area? Will hospitalized persons be monitored for compounding illnesses resulting from the NTPC project?

Question: Noise levels especially from harbor construction and operation of pumps at the port are of particular concern because first of the proximity to Olympic Memorial Hospital and secondly due to the clustering of residences around the harbor. The nearby hills tend to contain sound. What is the regulation for permissible noise level at the hospital boundary? How will the proposal conform to this? The hospital will be less than 8,000 ft. from the tanker berthing area.

⑩ Table 2.1.1.3-2, 2.1.1.3-4.
Question: The length of time over which sound was measured should be stated in the tables so that one can judge persistence of sounds (See table 3.1.1.3-2 and 2.1.1.3-4). Why was a 10 db correction factor added to the night time sound level? If this were not done what would the measurement values have been for 24 hour averages? What will noise levels be with the project in full operation for comparision with these same tables?

⑪ Deficiency: The BLM study of the Northern Tier Pipeline Company proposal appears to be inadequate in several areas with respect to fire and explosion data.

1. Worst possible case analysis:
   a. It is assumed that a 300,000 DWT vessel explodes. Severe structural damage is said to occur only within a radius of 1650 feet and moderate structural damage to 2250 feet. Yet in the S.S. Sansinena explosion of December 17, 1985, (see Coast Guard report number 16732/71895) involving a much smaller (70,000 DWT) vessel, heavy damage is described up to 1 1/2 miles from the site and scattered damage (on approximately equivalent term to BLM's moderate structural damage) more than 3 miles away. This Coast Guard study is referenced by BLM but there is no discussion of this discrepant data.
   b. Further, in this same study, the Coast Guard places the dollar damage at $21.6 million. There is no discussion by BLM of who bears financial responsibility and what dollar figure might be expected.
   c. With respect to "preventive measures and contingency plans", BLM mentions a "fire fighting escort vessel" but provides no information as to its size and pumping capacity. There is no discussion of how many fire boats are necessary. There is no discussion of the number of fire trucks required, who will provide these trucks, or where they should be stationed. In the C.G. study referred to above, the following were used to fight the effects of a 70,000 DWT vessel fire (remembering that we are dealing with vessels of 300,000 DWT or more):
      (1) 5 fire boats.
      (2) 7 fire engines.
      (3) 9 ambulances.
      (4) 2 helicopters.
      (5) 240 uniformed fire fighting personnel.
   d. With respect to injuries and medical care required, no discussion is provided. In the above C.G. report 22 crew members were injured, 8 crew members were killed, 1 termial security guard was killed, and 36 "innocent bystanders" were injured. The only hospital capable of providing emergency care of any scope on the North Olympic Peninsula is Olympic Memorial Hospital located approximately 7800 feet from a berthing site. This is well withing the range of structural damage from an explosion. Similarily, the C.G. bases is located next to the berthing sites. What would be the effect of an explosion on the ability of the C.G. to helicopter patients to Seattle, particularly if the local hospital were unable to provide the necessary support either by virtue of overcrowding, structural damage, or excessive quantities of smoke?

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2. Subjects not considered:
   a. As mentioned above, the Olympic Memorial Hospital of Port Angeles is the ONLY medical facility on the North Olympic Peninsula. The hospital is located approximately 7800 feet from a berthing site. There is no discussion of possible impacts on this hospital, either from a catastrophic explosion or even effects of overcrowding during construction phase. Further, it is apparently assumed that an explosion can only occur at a berthing site. This assumption appears invalid; what would be the effect on the Olympic Memorial Hospital if the explosion occured 5200 feet or less away? Could smoke from such a fire render the hospital nonfunctional? Is there a major facility in this country located this close to a major oilport? Should our hospital and therefore our community be put at such risk?
   b. With respect to other buildings, homes, fuel storage areas, etc. located on our harbor, there is no discussion as to possible impacts secondary to a major explosion. Could a vessel on fire drift toward shore and endanger any of the above?
   c. There is no discussion of the adequacy of the road on Ediz Hook to both provide necessary support services in the event of an explosion and to transport victims away from the scene. Could this road be seriously damaged by such an explosion and rendered non-functional?

   d. The factors which can intensify a blast effect should be discussed thoroughly. This is particularly necessary regarding relevant characteristics of local topography. One way the blast effects are intensified is through temperature inversions. Another way is by a following wind. Both of these weather traits would be frequent occurrences in the Port Angeles area. Structures on the mountain slope facing the proposed tanker port would increase the chances for damage from intensified blast waves.

   To avoid litigation from routine demolition activities at its depots the Department of Army on contract DA-04-495-ORD907 in 1957 had the Explosives Research Group, University of Utah, under Dr. M. A. Cook, develop guidelines for detonating chemical explosives without damage to private property. Table A, page 16 of their report, "Measurements of Air and Ground Shock Disturbances arising from Demolition Activities at Umatilla Ordinance Depot" shows window damage at the extreme distance of 4,000 feet for an explosive charge of 1,000 pounds. In Table C on page 17 of the same document an instance where windows were broken at 10,000 feet by a 2,000 pound charge. The report confirms that window glass failure occurs before any other structural failure.

   It is recommended that air shock intensity measurements be made under varying meteorological conditions at Port Angeles before any decision is reached to place explosive cargoes in the harbor. There is an Emergency Explosives Anchorage at Freshwater Bay. Determine procedures used to locate such an anchorage.

It is obvious that the BLM-DES analysis of this important area has been superficial. An in-depth analysis of fire and explosion risks is essential.

12 Deficiency: Most campsites in Clallam County that are not on city sewer, have on-site disposal systems (i.e. septic tank and drainfields) that were designed for seasonal use during the summer. Full-time use of these systems year round by construction workers will lead to drainfield failure and surfacing sewage problems. This is a severe public health hazard.

13 Omission: Impacts of undetected spills (up to 3,540 barrels per day) on homes using ground or surface water for drinking water are not given. Once the ground water aquifer is contaminated with oil what will homes using that aquifer do for water? Main areas to be concerned with are high water tables and permiable soil, where the pipeline would be buried right in the water table. What are the impacts of shallow wells and springs serving homes in such areas?

Deficiency: The BLM should more thoroughly study the impact of the pipeline on ground water quality (degradation). NOTE: Further comments regarding water quality are contained in the "Water Quality" section of this report.

P

## OIL SPILLS

Section 1.4; Page 1-9.

Question: The document states, "Support facilities and services for tanker unloading facilities would include controls, communications, electric power supply, oil spill containment and recovery and tug services."
- What precisely will these facilities do?
- What exact services will they provide?
- Who pays their cost?
- Oil spill and containment in particular -- what exact services are these?
- Are they proven effective?
- Who pays the bill?
- How many hours away is the service?

Section 1.4; Page 1-10

Omission: No figures are given for the quantity of bunker fuel which will be needed by the ships using the NTPC facility. Nor is the bunkering operation assessed for oil spill dangers. The entire bunkering operation should be examined closely since the danger of spills is probably comparable and bunker fuel is more toxic than crude oil.

Question: The document states, "The fuel oil barges would be equipped with heating coils, pumps, hoses and hose handling gear." What safety measures are there to prevent oil spill and evaporation loss?

Question: Runoff and oily wastes would be diverted to a holding tank installed on each berth platform to process the holding tank contents. How effective would this holding tank be in a storm similar to the one of February 14, 1979, which blew out the Hood Canal Bridge and broke loose many log booms in Port Angeles Harbor?

CONT

Section 1.4; Page 1-11.

Deficiency: The document states, "For a large catastrophic spill the services, equipment, expertise of the Clean Sound Cooperative would be used."
- Much more data is needed to show where it is located and what facilities and capabilities will be available for the NTPC project.
- What techniques do they employ in a large spill?
- How many spills have they effectively cleaned up?
- Would the equipment be stationed in Port Angeles, or how many hours away.
- Could they get here if there were storm conditions?

Deficiency: Equipment to be kept on hand at this location would be determined during the development of the Spill Contingency Plan . . . Where is the Spill Contingency Plan and how do we know the equipment will be adequate?

Question: The DES states, "Semi-permanent oil booms would be installed between ship and shore."
- Have these booms been proven effective?
- Would they work in a storm situation?
- What happens to the contained oil?
- What will happen to that portion of the oil that evaporated and dissolves?
- Will this permanently contaminate our harbor?

Deficiency: The document states, "For a more dispersed spill, NTPC would provide a skimmer recovery vessel." What statistical evidence is available to show that this skimmer recovery vessel would get the oil? What water conditions will limit its operation?

Section 1.4; Page 1-11; Column 2, Paragraph 2.

Deficiency: "Preliminary studies by NTPC indicate that leaks as small as 50 to 100 barrels or 0.07 to 0.14 percent respectively, of the contents of one line could be detected." This statement is ambiguous. It gives no indication of the time over which lesser quantity leaks could be released without detection, how long it would take after detection for a minimum leak to be repaired or how much oil would be released before repairs were completed. It is also inconsistent with the handling of oil leaks from the pipeline, see page 3-70, Table 3.2.6.2. The document indicates that only gross leaks would be noticed by the secondary leak detection system. This should be emphasized in the risk analysis section.

Section 1.4; Page 1-11.

Omission: The leak detection system in use during operation of the underwater pipeline is said to detect leaks of .5 percent of the pipeline capacity. What is not stated is that this is 500 barrels per hour per pipeline. Any leak of that size or less would have to be detected visually either by chance or during the "twice daily" check of the system by small craft.

Omission: The leak detection system outlined in this section depends upon the action of a dispatcher to shut down the system in the event of a leak. There is no discussion of the possibility of human error in this process or of what time lag might be involved.

Omission: It is stated that "relatively small amounts of oil would produce a sheen on the water surface that could be detected visually." What does "relatively small" mean? It is stated that the submarine pipeline would be buried "beneath the harbor bottom at sufficient depth to minimize the possibility of ship's anchor damage." What, exactly, does "sufficient depth" mean, in feet, and what does "minimize" mean (i.e. is it different from eliminate)?

Section 1.4; Page 1-14.
Question: "Recovered oil would be transferred back to storage. The effluent would be piped to the main oil $H_2O$ separator for final processing." What happens to the water that has dissolved hydrocarbons in it when it mixes with oil?

Section 1.4; Page 1-24; Column 2, Paragraph 2.
Deficiency: The DES indicates there are no scrapers in the underwater pipe system. Does this imply problems associated with build-up in mainland pipelines are not inherent in the underwater lines and therefore, scrapers are not needed? If launching and receiving sites are not located at pump stations the statement should discuss diking and spill protection at these stations.

Section 1.4; Page 1-31.
Deficiency: The DES states, "Deviations as small as 0.5 percent of the pipeline throughput would be detected and would provide a leak alarm within two minutes of the incident." How much oil can leak from the system without being detected?

Section 1.4; Page 1-49.
Deficiency: the document should give source data to justify the statement that: "The system as proposed would be redundant and estimated to have a reliability of 99.9 percent." What does this mean in terms of failure rate and in losses of oil which could go undetected or in inappropriate responses to signals to control valves? What is the response time of personnel to emergency situations at each of the unattended facilities?

Section 1.4; Page 1-55.
Deficiency: The "Spill Contingency Plan" outlined is inadequate. It does not call for pre-spill assessments of the biological and geological characteristics of the potential areas of impact. It does not mandate the acquisition of adequate clean-up equipment by NTPC (it calls only for lists of what equipment is on hand to be available--lists, rather than equipment). The plan calls for "initial" instruction for all personnel. What does that mean? The plan calls for action to be administered by NTPC "operating and management staff personnel" -- are they best qualified? Are they impartial, especially in regard to potential cost of clean-up operation?

Additional Concerns with Section 1.4

1 Omission: It is not an uncommon practice in this harbor for ships to drop anchor near the mouth of the harbor to help bring the vessel to a halt. What studies have been made of anchor penetration into the harbor bottom? If this has not been done, what is the basis for determining depth of pipeline placement in the harbor? What burial depth is currently planned for these cross-harbor lines?

CONT

Omission: Onsite storage, Green Point: How many tanks will be used for 1.283 million bpd? Show in figure 1.4-3 how they would be arranged. What water-proofing (oil proofing) material will line the basins surrounding the tanks? Give total volume of storm run-off for the fully developed facility (1.283 million bpd) and describe the amount of oil which will be discharged after the oil-water processing. This should include the oil dissolved in the water. Where is this discharged? What are the long-range, life-of-project to end point of oil-degradation, effects on the environment of such discharges?

Deficiency: Submarine pipelines: At a throughput of 1.283 million bpd how much time will the pipeline from berth to storage tanks be inactive? Give backup data and supporting studies for the statement that leaks as small as 50 to 100 bbl. could be detected. In actual practice how often are leaks of this size spotted? What is the theoretical liklihood of a small leak occuring at night when it probably could not be detected early? In terms of bbl. of oil spilled how much would likely escape if a large rupture occurred at a pumping rate of 100,000 bbl per hour a) in the daytime and b) at night? What is the expected "downtime" and the accuracy of measurement expected for the monitoring equipment (flowmeters, computer)? When this equipment is non-functional is the port to be closed down? How large a spill would be detectable by the simultaneous monitoring by computers on the amount of oil sent by the pumps and that showing on tank gauges? What is the normal range of variation permitted? When this has been calculated, please then give the amount of oil which could escape undetected. Include a reasonable response time on the part of the dispatcher.

Question: How is oil in a ruptured line taken out a) if the rupture is near the east end of the submarine line and b) if the break is at the west end? Is there suction capability at each end?

Omission: What size drainage system (to receive oil drained from pumps and piping) is present at the pumping stations? What is the maximum size leak which has historically occurred at comparable pump stations? Since these are un-manned, give the probable personnel reaction time to respond to a leak at each station, taking into account time to reach a responsible person and get him there, and how this might be modified by bad weather, snow, or ice. What would the worst case situation add up to in oil spilled? When block valves at such stations are closed how much oil could still escape.

Deficiency: Emergency block valves are too widely spaced with regard to unique environmental features and could not adequately protect them in the event of a major pipeline failure. It appears that the block valves were located without any consideration of the unique environmental features, protected shorelines, or major stream crossings

Deficiency: No figures are given for oil spill risks with a throughput of 1.3 million barrels a day. All tables which limit themselves to 709,000 bpd and/or 933,000 bpd should be revised to give figures for larger throughput. The ultimate is not 933,000 but 1,283,000 bpd. See page 6-4. Include the full project with 511 tanker calls per year, Class I standards violated 6 to 7 days per year in Olympic National Park, excessive sulfur oxide levels violating the Prevention of Significant Deterioration standards of the Clean Air Act on 32 days per year, one oil spill every 2.3 years for tankers in transit and every 3.9 years for spills at berths, a barge spill every 0.91 years, 1,022 port calls a year for fuel barges. Note that the historic record of spills into Puget Sound show that 77% of the spills there have been from barges. The maximum size of the tankers and the size mix of tankers at the fully developed state of the project should be presented.

Deficiency: The full environmental costs of this project need to be quantified and analyzed. This should include the costs which are external to the NTPC financial statements but which are, non the less, real costs to society. The expected value of damage caused by spills over the actual life of the project should also be calculated. These cost estimates should be made available before any public agency makes a decision which irretrievably commits public resources.

Section 2.1.1.7; Page 2-14.
Question: Why does the table stop at 50 mph wind velocity? Winds of considerably greater velocity are not uncommon to the Strait of Juan de Fuca.

Section 2.1.17; Page 2-20.
Deficiency: The document should discuss the millions of dollars local industry has expended to guarantee maximum recovery of the Port Angeles Harbor, qualifying the Harbor as a Class A - Excellent. ITT alone has spent over $90 million in capital expenditures. This does not include continuing operation and maintenance costs of pollution abatement equipment.

Section 2.1.15; Page 2-38; Column 2, last paragraph.
Error: This is grossly incorrect. The Strait sustains the greatest "part" of total traffic "in the vicinity". All vessels entering Washington's and Canada's inland waters traverse the Strait. Define "vessel activity". Does this include the Puget Sound fishing fleet. There are over 16,000 vessel movements annually off the Port Angeles Harbor in the Strait of Juan de Fuca.

2 Section 2.1.2.7; Page 2-88.
Error: Biological components, page 2-88: Marine areas that might be affected by the pipeline don't start at Hood Canal. The Straits would be affected by in transit oil vessels and by spills at the tank farm and its associated pipelines directly or via Siebert Creek; contamination of the Port would also affect these waters. A break in a line at the Dungeness River crossing or near it would foul up the estuary in Dungeness Bay. A spill in Port Angeles Harbor would also reach the Dungeness Spit and Bay. (See Coast Guard Study of a simulated small spill at Port Angeles Harbor) See also page 3-20, figure 3.1.7-2 where a tanker casualty off Neah Bay in September would coat South Vancouver Island, and page 3-24 where a tanker casualty off Port Angeles in September sends oil all over Dungeness Spit reaching to Southern Lopez Island (figure 3.1.7-6). If the tanker off Port Angeles had a casualty in March, Dungeness Spit again gets coated front and back and the spill reaches Whidby Island, Lopez Island and Burrows Bay. Chronic oil spills at the terminal in Port Angeles "could taint subtidal clams and decrease shrimp, crab and fish sports harvests.

CONT

Some diving waterfowl mortality. Water quality in harbor would be degraded." (Map addendum, page 68) BLM should perform more evaluation in this area.

3 Section 3.1.4; Page 3-12.
Question: The document states, "A large magnitude seismic event exceeding design criteria could occur; however, based on historical records . . . the probability is low." What are the historical records? What is the probability of a large earthquake?

4 Section 3.1.4; Page 3.12.
Deficiency: The DES states, "Where the pipeline or onshore facilities would cross or be located close to areas of known or suspected slope instability, such as the coastal bluffs, damage from slope failure could be high." What happens when a rupture of this magnitude occurs? What is the probability of its occurance?

5 Section 3.1.6; Page 3-14.

Question: Hydrostatic test water is taken from the watershed and a corrosion inhibitor and a bacteriacide are added. This will involve over 1,000,000 barrels (42,000,000 gallons) of water. This water is then dumped into Sieberts Creek and flows into the Strait of Juan de Fuca. How do we know what the effects of this "polluted" water will be?

Deficiency: The dissolved hydrocarbons from the oil/water separators are to be discharged into Sieberts Creek. This will have serious impacts on the Creek (according to Norhtern Tier's own study). This discharge should not be allowed. It is Northern Tiers responsibility to get this water to the Strait. Is it necessary that the effluent go into Sieberts Creek?

Deficiency: What are specific dangers related to abandonment and removal of oil from storage tanks, submarine pipelines and dismantlement of tanks?

6 Section 3.1.7; Page 3-15.
Deficiency: The Port Angeles harbor submarine pipeline construction short term would degrade water quality with suspended solids, less dissolved oxygen, uptake of heavy metals and chlorinated hydrocarbons by intertidal and subtidal clams; consumption of contaminated shellfish could affect human health. (Item 2, page 68 of Map Addendum) Rupture of Port Angeles pipeline to shore would have critical effects on shellfish, waterfowl would experience mass mortality in Port Angeles, offshore Green Point and Dungeness Spit. Consumption of contaminated marine life would present a health hazard. Why are these materials buried in the Addendum? Why are not impacts on Protection Island included? This is an outstanding habitat for seals and birds such as the rhinocerous auklet, tufted puffin and seagulls. These matters should all be futher discussed in the main document.

7 Section 3.1.7; Page 3-16.
Omission: There is no analysis of the risk of spills of bunker fuel shipped or barged in to fuel the oil tankers.

8 Section 3.1.7; Page 3-16, Column 1.
Deficiency: The doucment states, "The reported numerical risk values are not final statistical representations of frequency and magnitude and may change with analytical refinement." How can one truly understand the risks until these valuations are complete?

Section 3.1.7; Page 3-16.

Deficiency: Although the reliability of statistical methods is hedged in the ES, it is not clearly stated, as it should be, that there are no firm and accepted means for calculating oil spill risks. The majority of tanker and oil transfer spills results from human error. It is impossible to objectively quantify factors such as crew fatigue, language barriers, adequacy of crew selection and training, etc. A risk analysis must make subjective judgments on these and many other factors--the very factors that are most likely to cause spills.

9 Question: What is the degree of reliability of the trajectory studies? How do we know, with 95% confidence, what will happen?

Section 3.1.7; Page 3-16; Column 1, Paragraphs 4 and 5.
Question: Paragraph 4 lists estuarine currents as a factor in movement of oil spills. Why then do the oil spill trajectories not contain an estuarine current component?

Section 3.1.7; Page 3-17.

Error: Table 3.1.7-1 (Frequency of Tanker Spills) and Table 3.1.7-2 (At Berth Tanker Spills) are based on port calls for 933,000 bpd throughput rather than total volume throughput of 1.3 mbpd and three berths and three submarine pipelines. Also tables 3.1.7-3 and Table 3.1.7-4 are based only on two berth operation, not the total project.

10 Question: The DES states, "The estimates (for spill risks) are valid only if conditions do not change significantly from historical patterns." Is this reasonable, or does it undermine the efficacy of the entire spill risk analysis?

11 Error: "Since the exposure variable for fixed berths (i.e. the chance of a spill at a fixed berth) is the number of port calls per year these (spill) frequencies would be applicable to all ports using fixed berths." This implies that all fixed berth oilports have the same risk factors for ships at berth. This seems highly unlikely. BLM should clarify this statement.

Omission: No source is given for tables 3.1.7-1, 3.1.7-2, 3.1.7-3, or 3.1.7-4.

12 Deficiency: In analyzing pipeline spill risk, the DES uses pipeline mileageas the "exposure variable". The report admits that is would have been preferable to use volume throughput as the variable but claims the volume figures were unavailable. The final DES must have the pipeline risk analysis based on volume.

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⑬ Section 3.1.7; Page 3-18.
Deficiency: The document reports that, "An oil spill within Port Angeles Harbor would likely spread quickly enough to impact the shoreline before it could be transported out of the harbor." An oil spill contingency plan is not included in the DES. It should have been included and thereby allow government and public reviewers to critique the contents. Significant questions, including those regarding clean-up equipment, personnel, liability, resource recovery, etc. have yet to be addressed. Such an omission would constitute another justification for the issuance of a Supplemental Environmental Statement.

Section 3.1.7.
Comment: There is a need for a fundamental review of the risk analysis performed by the Oceanographic Institute of Washington (OIW). Concern is primarily with OIW's methodology. A review of past activities of the OIW regarding transshipment in Washington State should have been made prior to contracting for the subject risk analysis. OIW's involvement in this area is not without controversy.

In 1972, the Oceanographic Commission of Washington (OCW) published a Risk Analysis of the Oil Transportation System which was, in essence, a prelude to the growing debate over tankers in Puget Sound. In 1974, after lengthy legislative debate, the OCW published an offshore petroleum transfer systems feasibility study which was designed to demonstrate the viability of a major oil port "at or west of Port Angeles." OCW's report received legislative criticism for its bias.

Subsequently, in 1975, the OCW promulgated a four-point State Oil Transportation Policy which not only advocated a new single, common-use crude oil terminal at a site in the Port Angeles "vicinity", but also proposed that the State encourage construction of such a terminal through an economic incentive. In 1977, the OCW went one step further and urged the 45th Legislature of the State of Washington to enact legislation which would site a new crude oil terminal at or west of Port Angeles. At that point, the OCW got into the business of proposing and promoting legislation on this issue. It is a serious concern that BLM would let a contract for risk analysis to an institution with that kind of bias. It is acknowledged that the Oceanographic Institute of Washington, as distinct from the Oceanographic Commission of Washington, is a research institution. But it should also be recognized that the OIW is the corporate arm of the OCW. The enabling statute of the State of Washington clearly states that: "The OIW shall . . . coordinate, promote and carry out such policies . . . as may be formulated by the Commission." (RCW 43.94.050) Therefore, the entire work product by OIW for this EIS is subject to question.

In light of the OCW's espoused position on this issue then, it is not at all surprising that the OIW's risk analysis performed for BLM continues to allege the comparative assets of an oilport at or west of Port Angeles. In fact, to quote OIW's current work product, this latest effort nearly "constituted a refinement by the OIW of past risk analysis methodologies, many of which used port calls as the exposure variable." (Fires and Explosions: II-1)

It is interesting to note that back in 1972, before the OCW had a position on this issue, the OIW did not embrace this methodology so enthusiastically. In fact, OCW gave credence to the contention that "you can't compare ports because the topography is different and the number of ships utilizing any two ports may be significantly different." (Page 357) For example, just as you can't compare Port Valdez and Rotterdam, you can't compare the Strait of Juan de Fuca and North Puget Sound. Of the approximately 5,000 vessels entering the Vessel Traffic System (VTS) at Cape Flattery and traversing the Strait of Juan de Fuca, only 7% proceed to North Puget Sound. Less than that ever reach Cherry Point. That constitutes a staggering difference in vessel traffic densities between the navigational approaches to Port Angeles and Cherry Point. It is evident to most lay people that the Strait of Juan de Fuca sustains the maximum traffic density of Washington's inner waters. Port calls are clearly secondary to site exposure based upon traffic densities.

To assist in understanding this, one might examine what a comparison of Cherry Point and Port Angeles on the basis of port calls really means. It is true that x number of tankers call at Anacortes each month, y number of tankers call at Cherry Point each month, z number of tankers call at Tacoma each month, and so forth. Apart from occasional layovers at Port Angeles, none of these tankers literally call at Port Angeles. ⑭ Yet all of these tankers traverse the Strait of Juan de Fuca, regularly exposing Clallam County and Vancouver Island to the risk of a major oil spill. The net impact of x,y and z tanker traffic is concentrated in the Strait of Juan de Fuca--not at Cherry Point. This, of course, is not only not reflected in the OIW risk analysis but clearly circumvented.

OIW and BLM go on to postulate that the longer the distance traveled for a port call, the longer the tanker is exposed to hazards and events that cause casualties. (II-2) Is this ES assessing risk probabilities associated with a migrant tanker fleet enroute to inner Puget Sound or is this ES attempting to assess the frequency with which alternate port sites are actually exposed to tanker-related casualties?

In order to consider this in a larger perspective, one might take note of the methodology section of another Federal ES, published by the FEA in 1976 (Mandatory Canadian Crude Oil Allocation Regulations/DES 76-1: A-4) which acknowledges that the incidence of both tanker casualties and spills is proportional to the length of time and number of times tankers spend in various waterways. Port calls and distance were not factors.

One additional comment about OIW's approach to comparative site assessments. To quote the draft ES: "It was assumed that the current ban on tankers greater than 125,000 dwt east of Port Angeles did not apply. This allowed comparison of all of the alternate port sites with the proposed Port Angeles site."

First, there are currently no proposals for the transshipment facility at either Burrows Bay or Cherry Point. Secondly, current Federal law precludes any serious consideration of such a facility east of Port Angeles. Thirdly, a current Federal administrative order precludes supertankers from inner Puget Sound.

Then why are BLM and OIW using inner Puget Sound port locations as hypothetical port alternatives? Why are BLM and OIW dwelling on potential incremental risk based on distance traveled to Cherry Point when all factors are far from equal? There appears to be little merit in this kind of approach except for serving the express policies of the Oceanographic Commission of Washington. If BLM felt the need to make comparisons with inner Puget Sound site locations, then why weren't the comparisons realistic?

CONT

In OCW's 1972 report: "The final test of any mathematical model is how well it fits physical reality . . . But the key to testing the 'goodness of fit' of a mathematical model is the use of an adequate and unbiased data base. . . Once we start compromising the data base, the results can go from fair representation to being totally misleading." (Page 365) That Aptly summarizes differences with OIW's 1979 risk analysis for this ES. It would seem that OIW and BLM have seriously compromised the risk analysis methodology and the result is "totally misleading".

⑮ Section 3.1.7; Page 3-25; Column 1; Paragraph 4.
Error: The oil spill risk for a submarine pipeline rupture based on 50,000 barrels per hour is incorrect. Project design is for a 100,000 bph pump rate for each line for 300,000 dwt tankers. (Project Description of the Site Certification Application, Volume 1, page 6-9) BLM should correct this."

Section 3.1.7; Page 3-25; Column 1; Paragraph 5.
Deficiency: What is the maximum submerged pipeline spill potential? With a maximum of 100,000 barrels per hour times .05% leak rate, the spill for one line would be 500 barrels per hour.

Section 3.1.7; Page 3-25; Column 1; Paragraph 5.
Deficiency: the document does not address the procedures to be used to repair the submarine pipeline after a rupture or leak. Nor does it discuss the damage impact potential of such a repair operation. Further discussion of the matter is warranted.

Section 3.1.7; Page 3-25; Column 2, Paragraph 3.
Comment: Tar balls also float to the surface. The floating balls attract birds which become coated and usually die. Oil that becomes impregnated with salts is nearly impossible to clean from birds.

⑯ Section 3.1.7; Page 3-25; Column 2, Paragraph 5.
Deficiency: This is a paragraph of technical data describing the immediate effect of an oil spill. What does this data mean? This paragraph alone is not an impact. It should identify the impacts in terms of fish kills, bird oiling, etc. that can be expected to result from the project.

⑰ Section 3.1.7; Page 3-32.

Deficiency: "Depending on the spill size, crabs and shrimp could either be killed or suffer sublethal toxic effects . . ." This is not sufficient analysis. Where are the numbers: what size spills would produce how many dead crabs, etc?

Question: The statement is made: "Ingested oil from contaminated prey would not affect pennepeds significantly." What is the source for this statement? What documentation is there? Note the conflict with later statement on the same page: "Oiled birds would ingest significant quantities of oil while preening their plumage and the ingested oil would inhibit reproduction." Are pennepeds (seals and sea lions) so much different from birds?

Section 3.1.7; Page 3-32; Column 2; Paragraph 2.
Comment: Oil spills, especially small quantities over long periods could displace food fish which would disperse birds from areas that are traditional protected shelter areas. If birds are forced into open, exposed waters during storms they can become stressed and their chances for survival are reduced.

⑱ Section 3.1.12; Page 3-41; Column 1, Paragraph 1.

Error: An oil spill of much less than 420,000 gallons (10,000 barrels) inside the harbor could significantly impact sandy beach or land areas of Ediz Hook requiring intensive cleanup and possible removal of oil soaked soil.

Comment: Paragraph three describes a spill of 10,000+ as catastrophic. Paragraph two assumes a spill of 100 barrels would impact adjoining land.

⑲ Section 3.1.12; Page 3-41; Column 1; Paragraph 3.
Omission: There is a strong concern with impacts of oil mixing with wood chips and other log boom related waste products. Will it allow oil to accumulate into oil balls more rapidly and sink or will it create floating mats of oil? The combination in this area could have significant impacts on resources. An investigation and discussion of these probabilities should be presented in depth.

⑳ Section 3.1.14; Page 3-48; Column 1, Paragraph 4.
Omission: BLM should present a worst case impact figured in 1978-79 dollars. The statement does not discuss what the impacts a 50-100 barrel, undetected leak would have if it lasted one day or one week. It also does not state how much oil would be spilled before such a leak was detected and repaired. Many general statements are meaningless.

㉑ Section 3.1.15; Page 3-51; Column 1; Paragraph 3.
Omission: The document gives Canadian estimates of the clean-up costs per lineal foot of shoreline. Based on these figures BLM should calculate the estimated cost of each of the project spills identified on the trajectory maps in the risk analysis section. Also, the estimated clean-up costs of a 50-100 barrel undetected accident and 10,000 barrel major accident in Port Angeles Harbor should be stated.

The clean-up activities should be in detail. Discuss material removal, sterilization, oil removal, etc. Identify mitigation to replace clam beaches and other resource areas if they will receive secondary impacts of clean up.

㉒ Section 3.1.15; Page 3-51; Column 1, Paragraph 6.

Deficiency: Torrey Canyon spill in 1967 (12 years ago) cost 27½ million for clean-up costs alone. What were the economic impact costs from that oil spill and who and how much was paid out in damages relating to same? What method of collection was used to get payment? The Amoco Cadiz liability problems represent a current example of problems in this area and should be thoroughly discussed by BLM as a case study.

Question: How much money is now in the $100,000,000 Trans-Alaska Pipeline Liability Fund? How much has been paid out since it was created in 1973? What protection is there and what kind of liability fund exists for damages from Alaskan oil spills at berth or from fires or explosions related to same?

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Deficiency: More specific information is needed as to how private industries and citizens file claims and receive payment to cover damages incurred from major or minor spills.

Deficiency: The DES discusses TOVALOP and CRISTAL, two international oilspill liability programs. Figures given show liability limits of $10 million and $30 million respectively. Liability claims stemming from the Amoco Cadiz spill total hundreds of millions of dollars (over three billion dollars according to one press report). A candid discussion of maximum liability problems should be presented by the BLM.

Section 3.1.15; Page 3-55.

Deficiency: the document does not adequately address the specific impacts of a major oil spill. What effect would the delays in collecting damages and the costs relating to lawsuits have on the ability of industry and individuals to recover from the spill?

Error: The DES states that "data indicating the probability of a major fire or tanker explosion are currently unavailable." These data are given, however, in Table 5.1.12-2, page 5-9. There is no documentation of the effects of a fire or explosion.

㉓ Section 3.2.6; Page 3-67.
Question: Concerning risks of spills from pipelines, it is said that with new pipelines, "there is a leak rate of 0.0022 leaks per mile per year." This study then computes the total miles of stream crossings and determines (for a 20 year project) that 0.31 spills would occur. Is it documented that pipelines under streams have essentially the same risk of leaks as those underground? To several reviewers this statement seems improbable. BLM should clarify and document this statement.

㉔ Section 3.2.6; Page 3-70.
Deficiency: The DES states, "In the remote chance of a spill, the severity of impact on stream water . . ." The "remote" chance is 31% according to the DES figures on page 3-67. BLM should clarify the statement.

Section 5.1.7; Page 5-6.
Comment: Under "Operation Phase" the DES states "Chronic oil spills from tanker off loading could cause 'subtle' changes in organisms and communities . . ." Page 3-28 says, "Spill impacts from acute, short-term exposure to large quantities of oil or chronic long-term exposure to small quantities of oil would result from the chemical (toxicity) or physical (smothering) characteristics of the oil." "Biological impacts would include: 1) adverse effects on human health from eating contaminated seafood, 2) decreased fishery resources, 3) modification of marine ecosystems by the elimination of species which decreases ecosystem diversity and/or productivity, and 4) modification of habitats and delay or prevention of recolonization."

㉕ The use of the word "subtle" to describe these changes is unfortunate. The word can mean: thin, rare, tenuous, not dense or heavy. An it can also mean: keen, acute, hard to detect, intricate, and acting in an insidious way. It would be more proper, therefore, to avoid any chance of misunderstanding by rewriting the lead sentence to accurately reflect the adverse effects as listed on page 3-28. A possible revision would read, "Chronic oil spills from tanker off loading would cause drastic changes in organisms and communities . . ."

㉖ Section 5.1.13; Page 5-9; Table 5.1.12-2.

Deficiency: The risk of a large oil spill in the harbor is stated to be one per 255 years. This is not consistent with Northern Tier's analysis in their site application. (Compare page 8-38 of that document)

Deficiency: In discussing the impact of a tanker explosion in the harbor, the DES states that such an explosion "might cause physical damage, loss of life at the Coast Guard Station, nearby vessels in the harbor, and recreationists of Ediz Hook." No references are given for these conclusions. According to John Wiechert of the Clean Sound Cooperative, the risks are substantially greater than this, including significant danger to Port Angeles, the Olympic Memorial Hospital, and the Coast Guard Stateion. An in depth analysis of this potential hazard is mandatory.

㉗ Section 6.1; Page 6-2.
Error: The BLM-DES makes the statement, "A major spill is not likely to occur diruing the lifetime of the project." This statement is just not true. The Northern Tier application states, on page 8-38, that with 3 berths there is a 40% chance of a total vessel loss during the projects life.

㉘ Section 6.3; Page 6-4.

Deficiency: Table 6.3.2-2 shows the estimated frequency of in-transit tanker spills.
- Did the OIW take Canadian shipping into account?
- Did the OIW take Port Angeles-Victoria traffic into account?
- Did OIW take into account the fact that with increased tanker traffic, tanker spills increase exponentially, not arithmetically?

There is no answer to these questions. Such areas of concern should be discussed, and the answers documented.

㉙ Section 6.3; Page 6-6.

Question: Table 6.3.2-4 is entitled: "Estimated Frequency of Explosion and Fire Casualties Involving NTPC Tankers Traveling to P.A." What is a casualty?

㉚ Section 8.2; Page 8-3.
Question: The document states: "Operation (of a submarine pipeline) would increase the risk of marine oil spills." Compared to what? How great an increase?

㉛ Section 8.4.1.1; Page 8-12; Paragraph 4.
Comment: If a spill were to have an impact on the nearly level and fertile land in the Cherry Point area, it is more than probable that a spill in any one of the irrigation ditches or in the Dungeness River would have an impact on fertile farm land in Clallam County.

㉜ Section 8.4.1.6; Page 8-45.
Deficiency: Table 8.4.1.6-5 indicates that an onshore pipeline of only 117 miles, from Cherry Point to North Bend, would spill 1100 barrels per year, and yet a longer line (200 miles) from Low Point to North Bend would spill only 876 barrels per year. There should be adequate data shown to support these conclusions.

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## SCHOOLS

The following information was submitted to the Task Force by school district administrators. Although the comments primarily address the Northern Tier Pipeline Company Application for siting certification to the Washington State Energy Facility Site Evaluation Council, the concerns expressed are generally appropriate in regard to information contained in the Bureau of Land Management Draft Environmental Statement.

Additional information regarding school system impacts resulting from the NTPC proposal are contained in the analysis of project impacts provided by Mr. Reed Hansen, Urban Institute, Washington, D. C. The analysis is attached as Appendix "A" of this report. Mr. Hansen produced his analysis while under contract to the Oilport Task Force.

### REACTIONS TO EXCERPTS FROM
### THE NORTHERN TIER PIPELINE
### APPLICATION FOR SITE CERTIFICATION

① Page 1.15-10, Table 3-1.15-2 - Data reported is felt to be incorrect. Actual Sequim School District enrollment data is currently more than one hundred students in excess of the enrollment projected for 1980.

Page 1.15-10 - The impact statement does not reflect the current school construction program in the Port Angeles Public Schools.

Page 1.15-11 - (the second complete paragraph) Private Schools - the impact statement is inaccurate in the number of private schools in the area. There are two private schools serving the Sequim District. The Port Angeles School District also has two private schools. I believe there is evidence that indicates that Port Townsend also has a private school.

② Page 2.15-1 - Introduction Statement - The Northern Tier indicates that, "the possible effects of population growth on schools will be negligible and are not addressed." Certainly the impact when compared with other realms of the entire impact statement may appear, and indeed be, small. The impact will, however, have significant financial effects on the Districts' financial status. Although the State, through the Basic Ed funding commitment, will provide for the operating costs of any additional impact students, capital costs for additional transportation, classroom teaching space, equipment, and instructional materials may be completely covered by the State.

Pages 2.15-7 and 8 - The Committee felt there was a need to verify the assumptions used by Northern Tier with respect to construction workers and school age children.

③ Page 2.15-10 - "In no case would NTPS induced employment during the operational phase generate a school capacity problem that would not exist otherwise." It must be clear that regardless of existing enrollments, any influx of students caused by temporary employment for pipeline construction as well as other activity of the Northern Tier Company would indeed have an impact on schools. It is simply not accurate to say that because schools in this area are considered by Northern Tier to be presently over capacity in enrollment that the influx of Northern Tier employees would have no impact. Impacts would exist in the need for additional transportation, classroom student equipment, books and other instructional materials, as well as the need for additional classroom space in some school districts.

Page 2.15-20 - The first paragraph of conclusions quoting the statement "Northern Tier will cause increased enrollment in the four school districts that serve the area for the marine terminal. In no instance will these increases be the cause of school capacity deficit. .....the project related enrollments will aggravate classroom space inadequacies." We would like to add in that it must also be noted that in addition to transportation, classroom space, equipment, instructional materials including textbooks will be impacted by the influx for an oil terminal.

④ With respect to Section 5 - Public Services Committed Mitigation Measures - It should be noted that under the section, Other Services, the mitigation proposed by Northern Tier Pipeline System (NTPS) is limited to advice and assistance for school districts in their efforts to identify government or other programs, grants or loans that might assist in mitigating the impact of the oil terminal. The people of these communities are not going to be in need of advice and assistance as much as direct financial assistance for those impacts which are not covered by the usual State or Federal sources for assistance in meeting local services.

Page 6-18, Section 6.15.1 - The NTPS makes comment relative only to school capacities. It does not in any way consider school needs in the areas of transportation, capital equipment, books and other instructional materials. The environmental impact statement tends to minimize the effect of the proposed project. The salient comment in this section which is repeated throughout the document, might be "project related enrollments will aggravate classroom inadequacies in the four school districts."

Pages 7.2-128-129 - It was important to the Committee that it be noted that during project construction about one hundred-fifty additional pupils would be enrolled in the four school districts and that about sixty additional students would attend as a result of the operation of the NTPS. These additional students will reflect an impact in capital costs as well as transportation, textbook, and other instructional material areas. The Committee's position is this: The influx of the additional students that were projected in the environmental impact statement will create an impact for which mitigating measures must be taken. The Committee is not interested in bleeding Northern Tier for mitigation of existing problems. It must be pointed out, however, where an additional number of youngsters enroll; transportation, furniture, textbooks, other instructional materials as well as space must be provided, regardless of how crowded or regardless of present enrollment. If an additional 150 students appear, 150 sets of equipment will be necessary. School Districts do not store additional equipment in reserve in the event that a pipeline might be built in their community. And conversely, if equipment is purchased and the enrollment declines as a result of a construction phase being completed, what does a school district do then with the additional equipment that has been purchased for these youngsters? The point is clear, an impact would exist and although it might be minimal, as Northern Tier has indicated in the overall impact statement, it could be of major proportions to some of the school districts involved.

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REACTIONS TO EXCERPTS FROM
EFFEC CONSULTANT REVIEW OF
NTPC APPLICATION

Page 242 - The application materials indicate, "current staff/student ratios for both districts are at or below state-wide averages. As shown in Table 2.1.15-9 Port Angeles School District could accommodate some additional students in the lower grades."

COMMENT: The current student/staff ratios in the Port Angeles School District are what they are by design. It has been a matter of policy as well as intense effort to bring the class loads in the lower grades to the level that is now in existence. Certainly, none of the applicants nor consultants would suggest that they are attempting to dictate district operation by determining teacher/pupil ratio levels at a level higher than the District is attempting to achieve. If additional students are generated at those grade levels in the Port Angeles schools by a contrived influx they would hope to maintain the levels as they are now for current student population as well as for any students who enter the system.

Page 511 - Table 5.1.15-1 - It is noted by the Committee that reference was made to, "unavoidable adverse impacts on schools dependent on timely application for and receipt of assistance."

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SOCIO-ECONOMIC

Description of the Proposal

① Section 1.4; Page 1-40, 42.
Deficiency: Job descriptions of required construction personnel are insufficient to allow one to determine how many positions could be filled by local workers. Job titles such as "Teamsters", "Semiskilled", and "Operator" do not tell what job skills are required.

Section 1.4; Page 1-50.
Deficiency: Nothing is said about any arrangement to guarantee funds to pay for abandonment and disposal when the time comes. A statement of financial position of NTPC consortium members is not enough. A trust fund (or the legal and financial equivalent) should be established to guarantee sufficient dedicated funds to pay for proper disposal.

Question: Who would be responsible for abandonment impacts and problems if Northern Tier went bankrupt.

Comment. It should also be noted that the project's stated 20 year economic life bears little if any relationship to the actual service life of the oilport and pipeline. The actual date of abandonment is not influenced by the selection of 20 years as the project's economic life.

Description of the Environment

② Section 2.1.1.13; Page 2-32.
Deficiency: Since the BLM DES was published the Hood Canal Bridge has been destroyed. This significant change in the peninsula's transportation network should be analyzed in terms of its effect on at least the following:
a. Transportation of construction materials to Clallam County.
b. Transportation of commuting workers.
c. The availability and price of consumer goods in Clalam County.
d. The effect on tourism in the county.
e. The ability of the local hospital to transport patients to Seattle.

③ Section 2.1.15; Page 2-38 through 47.
Omission: In describing the current social and economic conditions existing in Clallam County, this document expresses (page 2-46) a need for a more diversified industrial base and for additional jobs to stop youth - out migration. Yet the document omits any mention of the Clallam County Overall Economic Development Plan - a current plan, updated annually by a committee of more than 25 local business leaders working through the Chamber of Commerce. The goal of the plan is to "identify and set priorities to projects and programs that will reduce the County's unemployment rate." The 1978 plan lists 18 short-range, 8 mid-range, and 8 long-range projects, all of which could help the County reach its economic goals without the risks associated with an oil port. Therefore, the BLM statement of current social and economic conditions is incomplete.

④ Section 2.1.1.15; Page 2-39.
Question: How is the distribution of commercial catches defined? There are no refrigeration facilities in Port Angeles so a majority of the catch in the Strait is logged at other inland harbors.

⑤ Section 2.1.1.15; Page 2-41.
Question: Does table 2.1.1.15-6 include retirement income and Social Security benefits? Later data on wage and salary employment are available and should be used.

⑥ Section 2.1.1.15; Page 2-46; Column 2, Paragraph 3, last sentence.
Error: The BLM document states: "The Company is making plans to fund studies of impacts (NTPC 1978." The NTPC is not funding local impact studies. This need to be corrected.

⑦ Section 2.2.1.2; Page 2-154.
Question: The BLM document states "According to the Olympic Air Pollution Control Authority no new major industry is expected in the near future." Why should the pollution control authority be quoted as the expert on industry's location plans? What is the basis for this claim? BLM states without documentation that overall air quality in Port Angeles is expected to remain at about present levels. Since this section of the document deals with conditions through the year 2000, such broad statements should definitely be documented by supporting evidence.

⑧ Section 2.2.1.15; Page 2-156.
Omission: In discussing the future environmental conditions that could be expected if the Northern Tier project were not built, the document leaves out any mention of the short, medium, and long-range projects proposed in the Clallam County Overall Economic Development Paln, 1978.

⑨ Section 2.2.1.15; Page 2-156.
Deficiency: Not a word is written about the future plans

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⑨ of any industry presently located in Clallam County. The documents general statement "The principal industries of the local economy are expected to continue to grow," is hardly a sufficient description of the economic climate expected through the year 2000.

Impacts of the Proposed Action

Section 3.1.8; Page 3-34, Column 2.
Omission: An amortized economic loss to resources, considering a 100-year impact or even a perpetuity impact, should be compared against the positive benefits over a 20-year life.

⑩ Section 3.1.11; Page 3-37.
Deficiency: Visual impact of 25 storage tanks each 56 feet high and 285 feet in diameter, will be significant. What effect will this impact have on property value for current residents and future area development by landowners? How will they be compensated for this impact?

Deficiency: What measure will Northern Tier take to mitigate impacts to tourists and residents from visual intrusion for the life of the project?

Deficiency: The document does not speak to the total project with three berths. The addition a a third berth would further impact all visual resources.

⑪ Section 3.1.12; Page 3-39.
Deficiency: The BLM document states that relocating log storage will cause economic, traffic and air quality impacts. However, no discussion of these impacts is provided. Since these log displacements will definitely occur if the project is built, then these impacts should definitely be explicitly addressed.

⑫ Section 3.1.13; Page 3-46; Column 1; Paragraph 1.
Deficiency: The document states, "The Coast Guard's air operation at Ediz Hook might be adversely affected . . ." The constraints placed by this project on the Coast Guard's air operations should be discussed thoroughly.

⑬ Section 3.1.15; Page 3-49.
Omission: There is no Fiscal Condition sub-paragraph in this section. There are many generalities about increased costs of providing additional public services. The mitigation section even provides a partial list of available funds which, this document states, would probably apply to the construction phase. Yet no specific data are given concerning the dollar amounts of the impacts that need mitigating. A rigorous cost-revenue study of the project's impacts is needed before making requests for financial assistance.

⑭ Section 3.1.15; Page 3-49; Column 2, Paragraph 1.
Question: Are all social-economic impacts based on the 18 month or 22 month minimum periods for construction? Eighteen month and 22 month periods are interchanged. What would be the maximum construction period taking possible delay factors into consideration?

⑮ Question: What impact would Taxation Valuation Increases have on all segments of the community? What is the probable impact of pending alternative tax proposals on the projected revenue to be provided local governments in our area if the project is constructed and operated? Various proposals have been discussed by the House Revenue Committee and could be readily analyzed by the applicant.

⑯ Error: Any increase in costs to the operation of local mills would (not could) reduce their profits.

⑰ Section 3.1.15; Page 3-49, 50.
Deficiency: The document states that the population of Clallam County would be temporarily increased beginning four to six weeks in advance of the initial construction period, and that this would consist of less than 50 advance construction personnel. The document also states that "it is unlikely that many job seekers would stay without employment."

These statements should be justified in light of the experience of other major energy development projects and the set of unique living conditions and amenities found in the Clallam County area. The job may attract more workers than needed (as happened with the Alaska pipeline construction) and the document has not addressed the impacts if the unemployed stay in the county.

Indeed, the labor economics theory suggests that a more probable situation is as follows:

a. Would-be workers migrate into an area before construction in order to establish residency whenever the announced hiring policy is to hire local workers first.

b. Unemployment steadily increases before the project as workers pass up jobs in order to be available for the higher paying project.

c. As currently employed local workers leave their jobs to take the higher paying project jobs, the disappointed in-migrants take the jobs left open by the local worker switch.

d. Unemployment rises and stays high upon project completion when local workers find their old jobs filled, but are very hesitant to leave their home town to look for other work.

⑱ Section 3.1.15; Page 3-50.
Error: The statement claims that 110 more (secondary) jobs would be generated by construction workers expenditures (that is "induced" employment) and local construction procurement (that is, "indirect" employment). Page 1-40 and 1-41 pretty well establish that very little construction materials will be manufactured or purchased locally. Thus, this "indirect" employment multiplier effect is probably overstated.

⑲ Deficiency: Also, the statement should document the estimate of 160 local workers out of 750 peak jobs. How was this number developed? In its examination of the NTPC's site application, CH2M Hill stated that "to the extent that local hiring involves currently employed workers rather than unemployed persons or new entrants into the labor force, the project jobs and income are not necessarily a net benefit to the community."

⑳ Error: Employment and population effects of the Operation Phase could be underestimated due to the following:

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⑳ 1. Relocation of ship crews and families to Clallam County.

2. Build up of ship services and maintenance facilities.

The document states, ". . . tanker crews (and families) would probably not reside in Clallam County even if their ships were based there, since their travel to and from home is at the shipowners expense." This wrongly implies that payment for travel expenses is the criteria for crews locating in one area or another.

㉑ Section 3.1.15; Page 50.
Deficiency: The Environmental Statement submits that damages from an oil spill would have minor effects on tourism perfectly contradicts a statement on page 3-47, paragraph 3.1.14, Recreation Resources, Operation Phase, to the effect that an oil spill or submarine pipeline reupture would substantially disrupt tourist visitations.

The report speculates that oil tanker collision, spills, etc. would "affect a significant number of recreationists."

How then, can the report make the assertion three pages later that damages from an oil spill would have minor impact on tourism? The example of a 10% decrease in tourism at Santa Barbara, California being offset by increased motel business in the rest of that county is an invalid comparison. Port Angeles is the major urban center in Clallam County, and its harbor is the center of its recreational activity. Port Angeles is the gateway to the Olympic National Park and the U. S. terminal for the Victoria, British Columbia ferry traffic. The rest of Clallam County does not have sufficient tourist accomodations to offset the financial loss to the county of a major oil spill at Port Angeles.

The document does not quantify the losses of tourist business that would result from an oil spill. The environmental statement should either make a rigorous analysis of the tourist business in Clallam County and show why tourist business losses would be small, or the statement should explain why Santa Barbara and its tourists are so similar to Clallam County and its tourists that virtually the same result could be expected here. Additionally, data should be presented to allow one to put the "10% tourist drop" figure in perspective. How do we know that without the oil spill the tourist business might not have been up, say 20% thus making the total loss 30%?

㉒ Section 3.1.15; Page 50; Column 1; Paragraph 5.
Question: What is the basis for assumption that economic loss from tourist trade would be offset by construction worker expenditures? Tourist trade loss could continue past construction phase.

㉓ Section 3.1.15; Page 3-50; Column 2; Paragraph 5.
Deficiency: The BLM ES states "Fish production reduced by an oil spill could reduce the income of commercial and Indian fishermen. Additional work will be done to assess these loses when estimates of biological effects are completed." This document will remain incomplete until this additional work is completed. The ES must assess the probable economic loss to both commercial and Indian fishermen, due to direct fish kills and distruction of spawning sites, over the project's service life (operating life). Secondary economic impacts on local sporting goods stores, marinas and related businesses, such as boat dealers and repair services, should be addressed. The report should also document these numbers and give sufficent details as to how they were calculated.

㉔ Section 3.1.15; Page 3-51; Column 1; Paragraph 5.
Omission: This section is not clear. Will fishermen who lose revenue because they couldn't fish during an accident be allowed to claim those losses? If not how will they be reimbursed?

㉕ Section 3.1.15; Page 3-51.
Deficiency: The document does not adequately address the economic impacts of increased unemployment resulting from reduced profitability of mills' operation and constraints placed on industry by the NTPC project. Specifically, the combined economic impacts of electrical power curtailment and shutdowns due to air quality problems are not addressed. What would be the social impact on the community of such shutdowns and the resulting employment?

㉖ Section 3.1.15; Page 3-51; Column 2; Paragraph 5.
Deficiency: The document states, "Additional personal income generated in the initial construction phase would amount to about $28 million over the construction period. The ES does not tell whether this $28 million is in Clallam County alone or if it is statewide. Also, no information is offered as to how this number was calculated.

Housing, Rents, Impact on Fixed Income People

㉗ Section 3.1.15; Page 3-51; Column 2; Paragraph 5.
Deficiency: The document states, "Rental prices might increase 20 to 25% during the constrcution phase." The ES should tell how percentages were derived. The document does not say whether this rise in rents includes, or is in addition to, normal rent rises that would occur over the 22 month period without the project.

㉘ What is the size of the group of low and fixed income persons who would be "especially affected, because housing costs normally constitute a larger part of their budget"? Population trends and distribution by age shown on pages 2-40 and 41 do not show the large and increasing number of retired persons living in the county on a fixed income. The majority of the people in Clallam County are retired. Social Security benefits amount to $24 million per year (more than the combined payrolls of the four major mills in the county). The applicant has not addressed the impacts on the portion of the people who are retired (and their social and economic contributions to the area) if the amenities and aesthetics of the area are changed. No information is provided on the secondary economic effects that higher housing prices would have on the remainder of consumer spending.

㉙ Section 3.1.15; Page 3-52.
Question: The document suggests that special camping areas be made available by the National Forest Service for accommodating workers. Who would pay the cost of providing this camping space for the workers of a private company? Can any private business ask for and receive this service?

㉚ Section 3.1.15; Page 3-49.
Omission: There is no Fiscal Condition sub-paragraph in this section. There are many generalities about increased costs of providing additional public services. The mitigation section even provides a partial list of available funds which, this

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㉚ document states, would probably apply to the construction phase. Yet no specific data are given concerning the dollar amounts of the impacts that need mitigating. A rigorous cost-revenue study of the project's impacts is needed before making requests for financial assistance.

Unavoidable Adverse Impacts

Numerous adverse impacts which are not discussed adequately or at all by the BLM-DES are mentioned above in the comments on sections 3 and 4. Section 5 of this document should be rewritten to correct its deficiencies.

㉛ Section 5.1.12; Page 5-8.
Omission: Land use. This ES should discuss the foreclosure of other optional uses of the land at Green Point. Port Angeles is growing towards Green Point (to the east of town). There might well be many uses of that coastal bluff land in the next 20 (plus) years that are much better than a tank farm.

㉜ Table 5.1.14-1; Page 5-10.
Omission: The document fails to place a monetary value on the losses caused by various sizes of oil spills. There should be a discussion of the impacts from each oil spill risk analysis scenario in terms of days of use and dollars of revenue lost.

Short-Term uses vs Long-Term Productivity

Page 6-1.
Deficiency and error: This paragraph speaks of Port Angeles as if it were an area of environmental significance, but uninhabited by human life. "Existing environmental values" are not the only short and long term tradeoffs for the area. The future expansion (growth) of the community and its present livelyhood provided by existing industries is very probably threatened because of tremendous social and economic impacts that the Northern Tier project would have on the area.

㉝ Comment: In the Summary at the very beginning of the DES in the second paragraph, next to the last sentence it says: "The project would provide significant beneficial impacts to the economy."

In Chapter 6, page 6-2, first paragraph, next to the last sentence it says: "The project is also perceived as having a short-term and potentially long-term risks to health, safety, and the general quality of life which would not be off-set by short-term economic benefits."

Which statement is correct? How was this determined?

㉞ NOTE: A critical evaluation of this DES has been made by Reed Hansen, of The Urban Institute, Washington DC. His evaluation, which concentrates on the social and economic impacts of the project, is to be found in Appendix A.

We would like answers to each of the concerns and questions raised in that evaluation and expect those topics to be addressed in the Final Environmental Statement.

S

TOURISM/RECREATION

① Tourism is a major industry in Port Angeles and Clallam County and great consideration must be given to insure that the NTPC proposal will not have a detrimental effect on the tourist industry.

This industry depends on clean water, amenities, and recreational opportunities. It contributed $63 million to the county in 1976; between 1977 and 1978, this contribution increased between 15 and 25 percent. The BLM has not adequately addressed the impacts of the project on tourism.

Omission: The economic risks to tourist facility owners and employees should be analyzed by the BLM. "In economic terms, hardest hit have been the hotel owners in this tourist-oriented part of France. They so far have received no compensation from the government for losses suffered from reduced summer tourism, put as high as 75%....estimates by the regional tourist association that 12,485,000 tourists canceled reservations as a direct result of the Amoco Cadiz disaster." (Christian Science Monitor, 3/13/79, p. 16.)

Deficiency: A major attraction is Port Angeles harbor and the attendant recreational opportunities it offers to the tourist. Many tourists come to Port Angeles because of the salmon fishing that is available within a short distance from the launching area. During the fishing season, from April through September, it is not uncommon to see around 100 boats per day launched from the boat launching area near the gate of the Coast Guard Station and directly in the midst of the area selected by Northern Tier for their marine terminal. Although Northern Tier has indicated they would attempt to keep the boat launching area intact, there are serious questions about the feasibility and safety of having small boats mooring in and around the large tankers. Water quality as it relates to marine life and continued good fishing is also a major concern. The "Water Quality", "Fisheries" and "Oil Spill Risk Analysis" sections of this report will further discuss this concern.

② Omission: A large segment of the tourists visiting Port Angeles are in transit to Victoria, B.C. and in many cases it is their first extensive visit to a salt-water port. The City and downtown businesspeople are engaged in a large-scale improvement program to upgrade the waterfront. It is our intention to convert the downtown waterfront from industrial uses to a people place and thereby enrich the lives of our own residents as well as making tourists want to return to Port Angeles. This downtown area is directly South of the proposed marine terminal. Therefore, if steps are not taken to beautify and improve the aesthetics of the marine terminal it could ruin everything the City and the business community are attempting to accomplish. It is our desire that the analysis on the marine terminal could include steps or procedures that would improve its aesthetics. The BLM document fails to address this concern.

③ Table 2.1.1.13; Page 2-32.
Deficiency: Under the second paragraph on page 2-32, brief mention is given to "....regular ferry service to Victoria, British Columbia." This ferry service contributes to a large percentage of harbor vessel traffic (particularly in summer), yet it is not documented in Table 2.1.1.13-1.

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④ Sec. 2.1.1.14; Page 2-37.
Question: How many persons rode those 855 round trips made by Black Ball Ferry to Victoria in 1977? 1978?

⑤ Page 3-47.
Error: Under construction phase....Clallam County does not own the public boat launch.

⑥ Sec. 7.10; Page 7-4.
Question: How will NTPL oil port decrease the recreational boating facilities, in percentage points, in a ten (10) mile radius from the center of Port Angeles harbor? In a 20 mile radius? From a 30 mile radius?

In percentage points, how much will the oil port, with attendant tankers, decrease the recreational and commercial fishing in a 10 mile radius of center of Port Angeles harbor? How much in a 20 mile radius?

⑦ Page 3-39.
Deficiency: Two boat ramp launches will be displaced at Ediz Hook.

Page 3-39; Para. 3.
Error: Two boat launches are used throughout the year at Ediz Hook.

⑧ Question: What will be the effects of the pipeline on the Port Angeles public pier and Salmon Derby Days, an annual event?

Page 3-54.
Deficiency: Does not speak to passive enjoyment of Ediz Hook by motorists driving out just to enjoy the view and watch fishing boats come in.

⑨ Sec. 3.1.15; Page 3-49
Deficiency: It is not mentioned what the actual loss of tourism dollars would be from construction and operation activities. It is also not mentioned that conditions of crowding already exist, particularly in housing/motels, during the summer months.

⑩ Sec. 1; Page 2-38.
Omission: BLM shows a picture of ONP Visitor Center on page 2-38, but gives no mention of its proximity to Port Angeles' downtown and the fact that it is located within three (3) miles of the NTPC terminal.

No mention of the National Environmental Study Area which is adjacent to the visitor center and which was used by 7500 persons in 1978. No mention of the fact that the visitor center offers a spectacular view of the Port Angeles Harbor and the proposed unloading facilities. No mention of the annual 174,386 (1978) visitors which toured the visitor center and enjoyed the surrounding picnic and viewing lawns.

Hurricane Ridge offers outstanding views to the north, as well as into the inner Olympic Mountains. The viewing area north of the Hurricane Ridge Lodge and the hiking trails around Mt. Angeles, receive heavy use by visitors for this reason. The BLM should include these points.

⑪ Page 3-37.
Omission: One of the main viewing points on the Olympic National Park road to Hurricane Ridge is nine (9) miles up from Port Angeles. A viewpoint (at the tunnels) looking north offers a panorama view of the Dungeness area and the Strait of Juan de Fuca. Green Point is clearly visible and the tank farm would be a definite visual intrusion.

⑫ Page 2-30.
Error: Elwha is misspelled Elwah. Olympic National Park acreage is now 908,692.46.

⑬ Page 2-31.
Omission and error: The map has several omissions and errors. a) Olympic National Park should be shown in the recreational category or, better yet, as a category by itself. b) The Heart o'the Hills parkway corridor and park headquarters should be shown as Park land. c) Dungeness Spit should be labeled and color-coded to reflect its status as a National Wildlife Refuge; "recreational" is not an adequate description.

⑭ Page 2-38.
Error: The correct acreage for the total Park is now 908,692.46.

⑮ Pages 3-2 and 3-4.
Deficiency: In reference to the Olympic National Park, "Main park boundary" is a meaningless term.

⑯ Page 3-47.
Deficiency: Impacts on visitors to the Olympic National Park who expect and seek a pristine environment, should be discussed in the section on Recreational Resources.

⑰ With the Hood Canal Bridge now inoperable, visitation to the Olympic National Park may decrease, but the pressure for overnight stays will likely increase as tourists find it impractical to make a day trip to the Park.

⑱ Sec. 1.5; Page 1-59.
Error: The construction of an oilport in the Port Angeles harbor will not just "interrelate with (Olympic National Park's) pure air policies," it would violate those Class I air quality standards several times a year.

⑲ Page 3-7.
Error: In the section under visibility, BLM states "the effect on visibility in the Olympic National Park would be evident only to an observer on one of the ridges...." This is an error. The Park Visitor Center located three (3) miles from the unloading facility would be affected. The view from the front lawn and front door is currently unobscured.

Sec. 3.1.2; Page 3-7.
Deficiency: The effect on visibility in Olympic National Park would be evident to more than "an observer on one of the ridges." Thousands of visitors drive up to Hurricane Ridge every month of the year, many of them primarily for the splendid views of the Strait, Canada, Port Angeles and the mountain ranges.

⑳ Page 2-46.
Error: Second paragraph understates tourism. "Thousands of tourists come to the area each year...." Olympic National Park records visitation of nearly three million.

Sec. 2.1.1.14; Page 2-38.
Deficiency: Olympic National Park was visited by nearly

CONT

⑳ three million persons in 1978. The 1977 figures given by BLM should be updated.

Vista points along the road to Hurricane Ridge also include clear views of Green Point, proposed site of the onshore storage facility. Just a few hundred yards from the Lodge parking lot on Hurricane Ridge is a breathtaking vista northward not only to the Strait of Juan de Fuca and Canada, but to Ediz Hook.

Olympic National Park has eight endemic wild flowers and the endemic Olympic marmot as well.

㉑ Sec. 2.1.1.10; Page 2-27.
Omission: Trails were omitted from the listing of cultural resources.

㉒ Sec. 2.1.1.12; Page 2-31.
Omission: Several recreational areas have not been included in this map: Striped Peak recreation area and viewpoint on Freshwater Bay; City parks in Port Angeles; the Olympic National Park Visitor Center and the portion of the Park included in the 10 (ten) mile radius from tanker berths; and, one section of the Dungeness Spit was not depicted.

㉓ Sec. 3.1.14; Page 3-48.
Question: What would be the effect on Olympic National Park wilderness beaches if a tanker collision occurred off Neah Bay? Sport fishing is an important recreational resource in the area, but so is a wilderness beach for hikers, backpackers, etc.

㉔ Page 3-50.
Error: This is a gross assumption! Santa Barbara does not have a national park in its backyard attracting millions of visitors. Damages from an oil spill would have a major impact on tourism.

㉕ Sec. 3.1.14; Page 3-48.
Omission: BLM makes no mention of the proximity of the Dungeness Spit to Port Angeles Harbor or Green Point. The spit is a major recreational area, attracting 80,000 visitors in 1978. A significant spill would have a serious impact on recreational use.

㉖ Question: There have been statements concerning security and potential sabotage. Would this mean access might be denied to Bonneville Power Administration for NTPC right-of-way? For security, this would make sense because a remote site with difficult access involving a major pipeline and a line into a major grid (blackout potential) would be inviting to vandals, saboteurs, etc. However, this would be a major recreation impact because the right-of-way has many current uses (e.g., hunting, all terrain vehicles access, etc.).

㉗ Deficiency: According to some sources of information, it is very probable that several petroleum-based industries will site in the Port Angeles area if a major oilport is developed here. What would the impact of such development be on recreation and tourism resources, particularly the harbor, the Strait and the Olympic National Park?

㉘ Page 3-54.
Deficiency: Does not speak to social unrest and problems related to loss of recreational facility usage for local residents not only in the harbor area where recreational use as stated would be inhibited (forbidden). Harbor usage provides daily recreational facilities for shift workers in the area for a few hours of recreation before reporting for work at the mills. It also does not speak to loss of recreational facilities related to campgrounds, parks and limited recreational facilities for such activities as bowling, swimming and roller skating. Easy access as part of City, allows total population use of Ediz Hook after working hours.

㉙ Sec. 2.1.1.14; Page 2-37, column 1 para 5.
Deficiency: From LaPush to Neah Bay there are numerous trails and a USNPS maintained coastal trail from LaPush to Lake Ozette. Car access is limited.

Sec. 2.1.1.14; Page 2-37, column 2 para 5.
Deficiency: Moorage should not be an indicator of boating and boat fishing pressure. The number of trailered boats far exceeds moorages. (See Sequim Bay Marina EIS for data.)

Sec. 2.1.1.14; Page 2-37.
Omission: The recreational pursuits section completely ignores whale watching and bird watching in this area. There are chartered boat trips off the coast and in Puget Sound for both.

㉚ Sec. 2.1.1.15; Page 2-39, Table 2.1.1.15-4.
Deficiency: There is updated information on recreational bottom fishing available at the University of Washington and State Department of Fisheries.

Sec. 2.1.1.15; Page 2-41, Table 2.1.1.15-7
Omission: The BLM has omitted sport fishing and general tourism in this table. These are two of the major business in Washington.

Sec. 3.1.14; Page 3-47.
Omission: The impacts section on recreation is generally insufficient. Impacts are general, have no economic evaluation, and certain types of impacts are completely omitted from the statement.

㉛ Sec. 3.1.14; Page 3-48, column 1 para 3.
Deficiency: Green Point. If impacts are transmitted to Dungeness Spit there will be very significant impacts on recreation.

㉜ Sec.5.1.7; Page 5-5.
Comment: Also, if the sediment was washed onto beaches or shellfish areas what would the impacts be? Also, strong odors would effect recreationists in the immediate area.

㉝ Sec. 7.10.1; Page 7-4.
Comment: A maintained corridor would increase public access to wildlife habitats, thus increasing pressure from general disturbance, i.e. ORV traffic, and by localizing hunting pressure.

CONT

T

## TRANSPORTATION

Local government officials have reviewed the section of the BLM-DES dealing with transportation, and have found the information to be "completely inadequate." Little definitive information exists upon which an analysis can be based. Apart from the highly-increased use from construction workers and construction equipment, a great deal will depend upon whether large pieces of equipment and material will be brought in by truck or barge. The BLM should address the matters discussed below.

In the Port Angeles area, a primary concern is the existing roadway extending along Ediz Hook, which is presently in a condition of deterioration. A part of the lease agreement the city has with the Coast Guard requires us to provide a paved road on the Hook to the Coast Guard base. While the road is still passable, it is in definite need of rebuilding from the sub-base up. Tentative plans call for the city to rebuild this road after the Ediz Hook Beach Erosion Project is complete, which is anticipated during the summer of 1979. Proposed plans for the roadway call for a 22-foot width and designed to support highway (H-20) loading.

① The city faces a dilemma in that we need to rebuild the road in 1979 to maintain our agreement with the Coast Guard, but if the reconstructed road is not heavy enough to accommodate the passage of equipment to construct the marine terminal, it would be a waste of funds. What is needed from Northern Tier is then a forecast of traffic type and volume to see if a 22-foot, H-20 roadway is adequate. Secondly, if this type of road is not adequate, would Northern Tier contribute to a heavier roadway?

In addition, the overall impact of bringing an additional 500 or more families must be analyzed for its impact on the street system of Port Angeles. The city has been working gradually to upgrade our street and traffic system but this intensified use in such a short period of time would simply overwhelm the present traffic system.

② Deficiency: NTPC Washington State application does not refer to the Port Angeles area-wide TOPICS study conducted by Harstad & Associated in 1973, which deals with area traffic problems and possible solutions. BLM-DES does refer to this study, but goes on to cite a 1.5% per annum traffic growth rate used in the NTPC application rather than use the 5.3% per annum traffic growth rate which Harstad established by actual traffic counts and studies in the area.

Neither NTPC or BLM conducted any traffic studies in the Port Angeles area. Such studies are a necessary part of an impact analysis.

③ The transportation sections, including impacts and mitigations, contained within the BLM-DES seem to be based greatly on Northern Tier's Washington State application or information which is as much in doubt as is some of that which NTPC based their conclusion on.

Since BLM-DES contains similar information as the NTPC Washington State application, many of the same questions are raised and omissions are present.

④ Information from the applicant discussing equipment at the storage facility has been inadequate. The estimated number of dump trucks is four. Apparently, this is just on site dump trucks as they also show two front end loaders, and two front end loaders will keep far more than four dump trucks going. The only assumption can be made is that they are going to use an awful lot of local contractor's trucks to haul their gravel for their tank farm, and this figure is not shown on their estimated daily traffic.

In material of public record, the NTPC refers to the major highway and railroad crossings as normally being bored and cased with steel pipe. They list only two crossings in Clallam County which are the Milwaukee Railroad and U.S. 101 as applying to where the bored and steel pipe goes. We have many roads in Clallam County which we feel are major. Also, all our minor roads we feel should definitely be protected with casings under the right of way.

⑤ The information on access to the tank form is inadequate. In public records, NTPC refers to a new route from U.S. 101 to the storage facility, but the only route shown any place or referred to is just a new road from our existing county Old Olympic Highway into the storage facility. The location of their proposed road is on a very blind portion of the Old Olympic Highway, and the amount of traffic going in this way will definitely require some kind of acceleration and deceleration lane. This area is also subject to severe icing conditions in the winter, and it has a fast load of traffic through this area. It would be irresponsible not to give special attention to this situation for the operation of traffic, to say nothing of the much longer traffic count during the construction period. The existing Old Olympic Highway will have to be widened out as there are no shoulders on it. Also, this project should have proper signing and striping. What about during the construction? Any furnishing of signing and traffic control for the county road system and the state highway system? This is going to be a complete burden to the citizens of Clallam County and definitely should be worked out before any permit is ever issued.

Section 1: Page 1.18
Comment: The Old Olympic Highway is not a lightly traveled road for the level of service the local people are accustomed too. In 1978, it was having 2530 cars a day. It also is used as a bypass for State Highway 101. No provissions have been made to widen or upgrade this road.

⑥ NTPC information of public record indicated peak volumes during construction, well below the capacity for virtually every road for which capacities were calculated. This is very hard to believe where a lot of the roads we have are 16 to 18 feet wide, and there is no way you can increase the volume on them without widening the roads.

Neither BLM nor NTPC has addressed the level of service when they were talking about peak volume capacities. There are all kinds of levels of service with an inconvenience factor. We do have a tolerable level of service on most of our roads at the present time, and they are going to use the level of capacities which will put the level of service way below what we are normally used to.

CONT

In some cases NTPC has projections of traffic on some of the local road networks up to 1,040 trips per day, which is completely intolerable. NTPC has stated that to the extent possible, existing public and private roadways will be used for access to the pipeline construction right of way. There are many user's rights roads that are not on the county system that actually the hunters and loggers use, which are completely inadequate to handle heavy pipeline type construction. Some protection must be built in to assure that these roads, if they use them, will be built up and maintained to a level that will not interfere with the local residents after they get done with the pipeline construction.

Deficiency: Applicant has not listed the access routes for moving heavy materials and equipment to the pipeline area.

Deficiency: Did not show any standards to be used in improving existing transportation facilities.

Deficiency: Applicant has not described procedures to minimize erosion and other adverse consequences during the removal of vegetation, excavation of borrow pits, etc.

Deficiency: How does NTPC plan on holding down dust on haul roads?

Page 8-36
Deficiency: The road from State Highway 112 to Freshwater Bay needs complete re-building if site is located there.

Figure 1-4-12; Page 1-45
Deficiency: Proposal shows they will need roughly 66.4 cubic yards per 100 foot station for the bedding and select backfill around the pipes. Where is the material coming from? How is it going to be hauled?

Table 3-1.13-1; Page 3-45
Error: The increased traffic on Old Olympic Highway will be a significant impact. Also, the intersection with 101 will be a real problem during construction phase. How does the developer plan to control traffic at these and other locations of traffic congestion?

Page 4-7 & 5-21
Question: A road management plan is to be submitted. Such a plan should include road limits (road closure criteria) Most of the roads going south from 101 to area of pipeline would have to have road limits as they do not have any base and all are too narrow.

Page 3-108
Deficiency: Many of the roads leading to the pipeline spread have current volumes of around 100 cars per day. When you add 440 to 480 workers using these roads also, it will create safety problems on thes roads. The applicant says maximum traffic might reach 1000 vehicle trips per day.

⑦ Omission: The BLM-DES fails to address the problem of increased costs for construction materials and labor due to increased demand and short supply of gravel, concrete, steel, trucking, skilled personnel, etc.

⑧ Figure 1.4-12: Page 1-19
Error: For select fill on the onshore storage facilities, they show 35,000 cubic yard of select fill. The County Road Department computes it to be closer to 780,000 cubic yards. Where will it come from? How will it be hauled? Also, they show no select fill for the pipeline, but figure 1.4-12 shows select fill around the pipe.

⑨ Omission: No place do they bring up the increased help needed by the County Road Department to handle extra maintenance complaint calls from local people, added engineering, etc.

NTPC information, which is a matter of public record, discusses a stock pile area at Discovery Bay. With the recent amendment to the NTPC proposal regarding the "Cross-Sound" pipeline route, will the stock pile area be relocated near Sequim or Port Angeles? At what specific location? What impacts will occur as a result of this relocation?

⑩ Page 2-156
Deficiency: The negative thrust of the statement related railroad services should be eliminated and properly definitive statement included.

⑪ Page 2-156, Par. 1
Deficiency: Reference is made to U.S. 101 and figure 2.1.1.13-1 (page 2-13) Figure 2.1.1.13-1 does not depict the fact being verbalized.

⑫ Deficiency: Crossing roads will involve traffic stoppages and slowdowns, representing another inconvenience to the public. Please give details on traffic interference and add a reasonable dollar value for this as part of the public costs in the cost-benefit evaluation of the project.

⑬ Deficiency: 2.1.2.13: Transportation and Utility Networks: What provision will be made for summer traffic along Hood Canal during construction? This is of recently increased urgency since the sinking of the Hood Canal Floating Bridge. The area is closed at times for hours by landslides and those landslides may well be increased when NTPC tries to place pipe trenches just above the slide-sensitive hill! What effect will construction have on slope stability both here and elsewhere along the pipeline? The impact statement should address these concerns.

Sec. 5.1.11: Page 5-8
Question: How can #1 Paragraph 1 & 2 be considered significant adverse impacts if applicant has not adequately addressed them and neglected to propose positive mitigating measures?

Paragraph 1, 2, 3. Col. 1
Deficiency: What is source data for ERT's traffic volume statistic estimates?

Question: How many of truck deliveries will exceed load weight restrictions and by how much?

⑭ Deficiency: Does not speak to Front Street adequately related to traffic volumes and problems. This is main access route for Port Angeles, and through traffic west on Highway 101.

Deficiency: Does not include ADDED LOG truck traffic created by forced removal of Crown Zellerbach and ITT Rayonier log storage from harbor to land.

Deficiency: Does not speak to traffic congestion in total relating to rerouting of traffic from west seeking city access. In many cases, destinations of this traffic would

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need to use Front Street at some point.

Deficiency: Does not speak to traffic congestion at city intersections and traffic lights.

Paragraph 4.
Deficiency: All traffic increases regardless of source would have significant impact on city traffic flow.

Column 3
Deficiency: Other abandonment sections have not established abandonment removal procedures.

Paragraph 1: Page 3-43
Deficiency: Northern Tier assumes use of railroad for deliveries. What is site destination of rail deliveries? Will trucks and/or barges be necessary for completion of deliveries and if so in what number? If rail delivery not possible, how many truck or barge trip deliveries will be needed to replace this anticipated method of delivery?

⑮ Deficiency: Might possibly is not adequate site specification for relocation VOR station.

Deficiency: Does not establish availability or advisability of moving VOR to PA airport. Is land with 750 foot clearance in all directions available there?

Deficiency: Who would pay for engineering studies, revision of all navigation charts and relocation of VOR? How long a period of time is required for relocation? Are there any air navigation safety hazards to ongoing air traffic involved? What are procedural requirements and agency responsible for same?

What provisions have been made to regulate traffic during construction at the various construction sites?

What provisions have been made to provide parking, material stockpiling and equipment staging for the tanker facility, tank farm and pipeline route?

What are the proposed haul routes for materials to be delivered by land and also haul routes from barge deliveries to various construction sites?

Are there any provisions being made for mass transit movement of manpower both during construction and operation?

Where are the locations of gravel pits and justification of amounts from each?

What standards will the haul roads be rebuilt to.

What method does NTPC propose to use to keep maintenance up on all haul roads?

Where are plans for traffic control for dangerous intersections?

Proposed staff to handle complaints from increased traffic and dusty conditions should be planned for.

## UTILITIES

U

① Several of the comments relating to "utilities" are included in other relevant sections of this report, such as "Energy" and "Water Quality".

Section 1-14; Page 1.14-15.
Omission: Identify all wastewater sources and estimate the quantity and quality of discharge from each source.

Omission: Estimate quantities of storm water runoff, with substantiating data sources.

Omission: Provide a detailed description of handling and treatment of oily waste stream, including the expected stream effluent quality from the treatment equipment.

Omission: Describe disposal methods for in-plant oil streams from the pipeline facilities such as scraper traps, strainers, oil water separators, and sumps.

Omission: Estimate the quantities of sanitary and other waste that will require handling or treatment by others.

Omission: Substantiate the suitability of septic tanks at the proposed locations.

Omission: Identify quantities, location, and treatment methods required for discharge of the pipeline hydrotest water.

Omission: Identify and summarize provisions of applicable comprehensive solid waste plans and state hazardous waste regulations.

Omission: Identify types, sources, and estimated quantities of solid waste from construction activities or operations.

② Page 3-37.
Omission: Describe the proposed disposition of solid waste as required by local, state and federal regulations.

Comment: Impermeable membranes should be placed under and over oily sediments disposed on-site to prevent leaching to groundwater; this should be specified. NTPC makes the assumption that disposal in an approved sanitary landfill is adequate. Local governments will need assistance to adequately protect groundwater. If there ever is a major spill few sites would be able to handle oily cleanup wastes without great risk of future groundwater contamination. The BLM should address this concern in depth.

③ Question: What effect will the project have on the amount and type of solid waste produced in the community?

Question: What effect will any induced growth from secondary petroleum-related growth have on the amount and type of solid waste produced?

Question: Are disposal areas available and adequate?

④ Question: Will the project use, or encourage the development of, recycling or other efficient methods of handling wastes?

CONT.

Section 4.

⑤ Deficiency: The Clallam County Public Utility District will not supply water to test the transmission line; and therefore, Northern Tier must find an approved alternate source and also means of disposing of the contaminated test water. The BLM should address these concerns.

⑥ Question: Page 1-56, Paragraph 10 What disposition will be made of the soil saturated with crude? How will it be treated? Where will it be disposed of?

Question: What disposition will be made of other oily wastes in the case of an oil spill? Can such materials be burned without violation of the clean air act?

Deficiency: Page 1-47, column 1, paragraph 4. This paragraph does not discuss what will happen to the debris, slag and contaminants removed from the pipeline.

⑦ Deficiency: Basic questions remain unanswered regarding the production, accumulation and disposal of solid waste at both the on-shore and off-loading facility.

These questions are:

1. What amount and type of solid waste will be generated?
2. Will industrial or hazardous material be generated at either the tanker facility or the tank farm?
3. Will special or separate disposal methods be required at the Port Angeles landfill?
4. ⑧ What impacts on the domestic water system, sanitary sewer system and solid waste collection and disposal system will the increased population during construction and after have?
5. ⑨ What method will be used to dispose of bilge waste and bilge water (ballast)?
6. ⑩ Impermeable membranes should be placed under and over oily sediments disposed on-site to prevent leaching to groundwater; this should be specified. NTPC makes the assumption that disposal in an approved sanitary landfill is adequate. Most sites throughout the state do not adequately protect groundwater. If there ever is a major spill, few sites would be able to handle oily cleanup wastes without great risk of future groundwater contamination.
7. What method of disposal will be used for the oily materials which will routinely result from continuous cleanup of oil spillage (i.e. absorption material, oil soaked booms, etc.)?
8. ⑪ The amount of residue resulting from tank water drawoff operations and tank bottom sediment removal should be presented in order to ascertain whether there is adequate capacity in proposed waste disposal sites to handle the volume. It also should be demonstrated that the ground surface within the diked areas is impervious to oil seepage in order to assure protection of local groundwater. If these areas are not impervious to oil residues, the means by which groundwater resources will be protected should b identified.

⑫ Deficiency: The existing water uses of the Ediz Hook water main should be defined to enable assessment of its capacity to serve the unloading facility. The existing system may not have the carrying capacity to meet peak loads imposed on the system by tanker demands and still serve the City of Port Angeles. Also, information about water need and timing of withdrawal should be provided. Additional information on sufficiency of water supplies for firefighting should be provided if domestic water is in any way intended to be used for firefighting.

Deficiency: Additional information is needed to answer the following basic questions:

1. ⑬ Are there any fresh water requirements for fire protection?
2. What will be the maximum rate of use of potable water for (a.) ballasting (b) domestic and similar uses (c.)miscellaneous uses at port facility and support facilities?
3. What present requirements are necessary at the off-loading facilities?
4. What provisions are planned to prevent contamination of the City's potable water system?
5. What provisions have been made to supply the tanker facility with potable water in the event the City service is interrupted?
6. ⑭ What amount of water will be needed for hydrostatic testing of the pipeline and where will this water be discharged?
7. The applicant should detail the location (river mile and placement) and type of water intakes, including aquifers to be used, if any, and describe the impact of withdrawals on water volume, aquatic biota, and downstream users.
8. ⑮ What impacts on the domestic water system, sanitary sewer system and solid waste collection and disposal system will the increased population during construction have?

⑯ Comment: The subject of sanitary sewage and wastewater treatment is inadequately addressed by the BLM-DES. Additional information is needed and some of the questions which must be addressed are:

1. What method will be used to dispose of sanitary sewerage? What quantity of sewerage will be produced?
2. If a holding tank is used for sanitary sewerage, what will be the source of the sewerage? (i.e. tanker ships, shore facilities, etc.?)
3. Will sewerage from tankers be off-loaded at Port Angeles? If yes, what will be the chemical content in the sewerage?
4. What provisions are being made to handle storm water drainage and treatment at the tanker facility?
5. What method will be used to dispose of bilge waste and bilge water (ballast)?
6. The applicant should propose a treatment process and methodology to treat the hydrostatic test water if bactericides are used.

CONT.

7 In the NPDES application, the applicant states that contaminants other than oil, grease, and chlorides are not expected to be produced by the operation of the marine terminal. However, substances such as phenols, sulphur, and nitrogen-containing compounds, which are water soluble, can enter solution when oil comes in contact with water. These are considered potential constituents of the effluent and should be identified as such in item 16.

8. Also in the NPDES application the applicant states that insufficient information is available to estimate the concentrations of the parameters in influent and effluent water. Information from other similar facilities should be reviewed and estimates made for all specified parameters.

9. The applicant states in item 7 of the NPDES application that discharge receiving water will be the Strait of Juan de Fuca. It is stated that the holding basin from Phase II will discharge effluent to Siebert Creek. If so, this future discharge receiving water should be identified in the application.

10. Provisions for the discharge of water used to hydrostatically test the pipeline and storage tanks must be included in the NPDES permit in order to satisfy the requirements of WAC 463-42-455.

## WATER QUALITY

V

① Deficiency: The assumption that groundwater quality will be sufficiently protected by density separation between oil and water may not be valid. Once the oil reaches a groundwater supply point, replacing that supply or treating the water would be required. The water supplies downstream of the pipeline may lie in high permeable river gravels and pipeline crosses. If so, in several locations short distance separation will not provide much protection. Groundwater monitoring wells between the pipeline and the supply well would allow observations and time for corrective action.

Ponds or oil residue disposal fills on site should be lined to prevent contamination of the groundwater; if such provisions are contemplated, they should be described.

Surface areas within the diked areas must be impervious to oil seepage in order to assure protection of local groundwater. If these areas are not impervious to oil residues, the means by which groundwater resources will be protected should be identified.

② In order to assess the potential oil leakage from the submerged pipeline, estimates should be provided for the maximum amount of oil that could escape, even with the leakage detection system working and activated. At maximum operating conditions, the leakage rate not detected by the leakage detection system shouldbe 500 barrels per hour (100,000 x 0.5% = 500).

③ The applicant should provide specific information regarding the burial depth of underwater pipelines so that the potential anchor damage can be accurately assessed. Also, by providing burial depths, estimates of dredge quantities can be prepared.

Section 1-41; Page 1-41.
Deficiency: Paragraph beginning: ". . . the original site drainage patterns . . ." Much additional surface water will be produced because of the metal and other hard surface that will cover much of the area. Allowed to go into the ground it could well "grease" the clay layer of the bluff and cause massive bluff slippage. Very careful and complete handling of this extra surface water needs to be planned so that it passes safely into the strait.

④ Section 1.4.
Deficiency: Parking lot construction, roads and other structures should be described relative to amount of silt during construction and stormwater carried silt, road oils, toxic materials as benzalpha-pyrenes, heavy metals and coliforms, giving quantity of each and final deposit of such materials in the environment. What disposal will be made of effluent from laboratory sinks? What toxic materials other than oil will be discharged from this source?

⑤ Section 1.4; Page 1-13-14.
Paragraph 10 states ". . .affluent would be discharged into Siebert Creek and the Strait . . ." However discharge for Siebert Creek is not shown on figure 1.4-3, Page 1-13.

⑥ Section 1.4; Page 1-14; column 2; paragraph 3.
There is no discussion of water purification before discharge. BLM implies that the only thing in the water will be oil, yet in the risk analysis and impact sections they discuss soluble factions. BLM should identify the soluble factions in this water and how they are to be removed.

⑦ Section 1.4; Page 2-13.
Deficiency: Biological components: The impacts on Siebert Creek are directly connected to the onshore storage facilities and should be addressed under this heading. By separating the two the impacts are not as clear as they should be to the reviewer.

⑧ Page 3-14; column 1; paragraph 1.
Deficiency: What is amount of earth removal planned and location of disposal site for same?

Deficiency: Identify type and properties of lower permeability earth replacement material.

⑨ Deficiency: How does Northern Tier propose to prevent increased water runoff of 50% minimum at tank area and 95% minimum at office complex from reaching Siebert Creek. What potential damage scope to Siebert's Creek could this runoff have?

⑩ Page 3-14; column 1; paragraph 2.
Deficiency: What is basis for Northern Tier assumption ground water level would not change significantly? What is total recharge area spoken to and what percentage of that area does 294 acres at Green Point represent?

⑪ Page 3-14; column 2, paragraph 3.
Deficiency: Does not specify site of discharge for surface water runoff. What would be factor of determination for choosing Siebert Creek rather than Strait of Juan de Fuca or vice versa? Both site considerations lack specific entry site and impact data. What would maximum water runoff potential for 25 tanks be and how often would maximum occur?

CONT.

⑫ Section 2.1.2.4; Table 2.1.2.3-1; Page 2-50.
Question: Why is Clallam County omitted from the table?

⑬ Section 2.1.1.5; Page 2-12.
Deficiency: Well stated from the standpoint of erosion, but is totally lacking in considering the safe removal of the excess surface water.

Section 2.1.7.5; Page 2-54.
Omission: This section discusses soils from the standpoint of productivity to permeability to several other things, but totally omits a straight forward discussion of water table pollution by leaking oil pipes.

⑭ Section 2; Page 2-52.
Deficiency: First paragraph ". . .seven geologic hazards - etc" Why is oil pollution of the water table not considered as a very major geologic hazard?

⑮ Table 1.4-9; Page 1-23.
Clallam County should be added. The proposed pipeline route will cause the line to cross the following irrigation ditches: Ureka, Independent, Highland (2 branches) and Agnew. The Agnew ditch also supplies water to the McDonald Creek. These ditches take water from the Dungeness River above the proposed river crossing. The water is used for stock and domestic water in addition to normal irrigation. If a spill were to occur in the Dungeness River or in a ditch returning water to the river, irrigation ditches and systems downstream would be contaminated as well.

The effect of a pipeline leak or break within or near the watershed is adequately addressed by the BLM.

⑯ Deficiency: Regardless of the theoretical probabilities of a spill (which are discussed in the next section) or the precautions taken to detect and prevent such occurances, the possibility of a leak or break always exists. The proposed route passes through various drainages which are tributaries to large surface water supplies and over aquifers. It is therefore important for the site evaluation process to consider carefully the potential effects of any watershed spill on water quality, water supply facilities and public health.

Unfortunately the BLM does not directly address the consequences of such a spill. As a result, the content of the document consists largely of general assurances and references to precautions by the NTPC.

In assessing the possible effects of a pipeline leak or break within the watershed, it is first important to consider the amounts of crude oil which could potentially be spilled. The following situations illustrate the quantities involved:

> If block valves are located at an average of 10 miles apart (as implied in the document), then a complete rupture (caused by earthquake, earth slide, or intentional or unintentional man-caused damage) could under worst case conditions, spill as much as 82,000 barrels (or the equivalent of 430 tank trucks of crude oil).*
>
> Data on actual experience compiled by the U.S. Department of Transportation, Office of Pipeline Safety, places the average spill size for all pipeline accidents at 1083 barrels (or the equivalent of 5.7 tank trucks), although the average pipeline size and pressure, to which these statistics related, are undoubtedly smaller than those proposed by Northern Tier.
>
> A slow leak beneath the detection capability of the applicant's monitoring equipment (say, as little as 1 gallon per minute) might go unnoticed for a period of three months under snowpack. The resulting discharge would be 3085 barrels (or the equivalent of 16.2 tank trucks).

All of these amounts are significant -- and potentially disasterous.

At a river or stream crossing, the oil could be spilled directly into surface waters. If the oil entered a supply system it would cause drinking water quality problems ranging from taste and odor (which would occur at the parts-per-billion range after contact with chlorine) to direct health effects resulting from reactions between oil and chlorine which produce potential carcinogens. Also, if any significant amount of oil entered the supply system facilities, potentially enormous clean-up problems could result.

If a major disaster, such as an earthquake, caused a pipeline rupture, and the supply system had to be shut down to prevent or limit oil contamination, another kind of public safety problem could occur. During any emergency situation, an adequate supply of potable water is especially important to prevent the spread of waterborne disease and to fight the fires which often break out during such disasters.

Proposed containment and clean-up methods do not appear to be effective for a river-crossing or watershed spill. There are few places on the Dungeness River, for instance, where containment booms would operate properly. The river velocity is usually too great and oil would go underneath a floating boom. If a spill were somehow successfully contained above an intake, the rocks, banks and bank vegetation would still be coated and continue to release oil for days or weeks. High pressure pumps and fire hoses would be needed to wash oil residue downstream and vegetation would have to be trimmed and removed. Contaminated soils which could be reached would have to be excavated and removed.

Probably the most frightening effect of a watershed oil spill is the potential contamination of underground aquifers. Clean-up of underground aquifers would depend entirely on natural processes -- and a great deal of time.

Page 2-42.
Deficiency: Clallam County Public Utility District has not been contacted RE quantity of water required or potential water quality degradation.

Page 1-15.
Deficiency: Clallam County Public Utility District has not been contacted regarding mitigating measures necessary to insure an adequate amount and quality of potable and fire water.

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*Theoretically, the spill could even be twice this amount, if the block valve is in the failure area.

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Page 1-14, column 2, para. 3.
Omission: There is no discussion of determining permeability of the soils in the 190 acre tank farm site and how they intend to protect the identified shallow water aquafers from oil pollution in case of major spills and/or major spills which are identified in the operations phase of the impact analysis.

⑰ Page 3-14.
Deficiency: What is specific water source for tank farm and availability of maximum daily need for total project three berth operation?

Page 3-14.
Deficiency: What is effect and geographical land area identity affected well drilling ground-water drawn on onshore storage at maximum three berth operation?

⑱ Deficiency: Northern Tier's 1960 data basis stating no problems with salt water intrusion related well drilling at the tank farm site is outdated. Based on updated land development and current 1978 information, what would problems relating to salt water intrusion encompass?

⑲ Question: If an oil spill occurs in the Straits or Harbor will it infiltrate the P.U.D. well system located in the "Bluffs" subdivision area? When pumping, 75% of water comes from the strait side and 25% comes from the mountain side according to Robinson and Noble, groundwater geologists.

Page 3-13; column 1, paragraph 4.
Omission: There is no discussion on how oil spills and fluid leaks will be prevented from entering ground water.

Comment: The Clallam County Public Utility District will supply water for fire fighting resevoirs, but will not supply fire protection, as we don't have the capability to supply fire flows associated with this type of operation. This must be done at off peak times and at the convenience and direction of the District.

Comment: If Northern Tier plans to pump from wells, they must prove by testing that they will not affect the capability of the "Bluffs Well". Any further drawdown of the aquifer than what is being experienced now will have drastic impacts on the existing well. We are already restricted in the amount of water pumped from this well; and any further use of this aquifer will definitely restrict its use even further.

⑳ Comment: The present plan calls for a deep trench to be dug at Green Point to allow the two submarine lines to gradually ascent the steep bluff. If this were allowed, the trench would cut into the aquifer that supplies the existing Bluffs Well and Pumping Station, which -- due to the facts that

A. The static water level is approximately 0' in elevation.
B. The static water level definitely fluctuates with tidal action.
C. The well is only approximately 880' away from the shoreline.
D. The trench dug by Northern Tier will be dug below sea level.

very possibly will lower the static water level and bring about salt water intrusion. This matter must be taken into account and provisions made to mitigate all impacts.

㉑ Question: How will industrial sewage (in particular, oil sludge) be handled so as to assure that no impacts will be felt by this aquifer?

㉒ Page 3-15; paragraph 6.
Omission: Earlier discussion mentioned toxic materials in sediments. They are not mentioned in this discussion. Washington State Department of Natural Resources and Environmental Protection Agency have standards for water disposal of dredge spoils which will have to be met. The statement does not discuss sediment drift.

Page 1-47.
Deficiency: Water withdrawls could conflict with other identified uses during several times each year. With the advent of the "Federal Safe Drinking Water Act," drinking water standards are becoming increasingly restrictive. The Washington Department of Social and Health Services has instructed Tacoma Water Division that if an oil pipeline were built in their Watershed, they would have to view the pipeline as a source of contamination and require the utility to change from a process of simple chlorination to one which would be able to remove a limited amount of petroleum product. In the event of a major spill the utility would have to have an alternate source and there is a question about whether an adequate alternate source could be found. Concerns would also arise concerning the possible carcinogenic effect of chlorinated hydrocarbons which would be present if an appreciable amount of petroleum entered the chlorinated water supply. Results of present EPA studies should give some information on this problem. In addition to the anxieties expressed by the Water Division and the Department of Social and Health Services, Tacoma's Public Utility Board and City Council have expressed serious concern over the threat to their domestic water supply. Public and private water systems are equally concerned over their supply systems. The BLM should address the problems mentioned above.

㉓ Chapter 8; page 50; paragraph 2, under Soils.
Question: "From Green Point eastward the soils are loams and silty clay loams on nearly level to steep slopes. Water tables within 2 to 3 feet of the surface are common nearly level slopes."
Under Aquatic Resources:
"On the Olympic Peninsula between Green Point and Grays Marsh the major aquifers include cutwash alluvial deposits. The depth to the regional water table varies from about 10 to 70 feet."

Which statement is correct? The above section refers to the underwater proposed route.

㉔ Section 1; Page 1-47.
Question: Seventh paragraph beginning "Water for testing . . ." Elsewhere also it is stated that water will be taken from the Dungeness River for much of the Northern Peninsula. This river water is already way over adjudicated. How can anyone legally give up water in addition to that already illegally approved?

㉕ Page 3-14; Column 1; Paragraph 3.
Deficiency: What is the basis for the assumption Dungeness River Water will be used for hydrostatic testing.

㉖ Deficiency: What impacts would two weeks constant pumping of Dungeness River Water for hydrostatic testing have on fish, marine organisms and plant life in the river? Preventative measures?

CONT.

㉗ Deficiency: What month of the year would water be withdrawn from the Dungeness River for hydrostatic testing, permit requirements and monitoring measures for same?

㉘ Deficiency: What are alternate available sources of water for hydrostatic test withdrawl? 7,480,000 gallons of water are required for testing two submarine lines and initial eleven storage tanks. Requirement, source and procedure for subsequent construction and testing.

㉙ Question: Does three years of record statistics used by Northern Tier for availability of Dungeness River Water for hydrostatic testing include the lowest stream flow years ever recorded for Dungeness River and what years were they?

㉚ Page 3-14; column 2; paragraph 1.
Deficiency: How long would hydrostatic test water remain in tanks and submarine lines?

㉛ Deficienty: Does not identify inhibitor and bacteriacide which would be added to hydrostatic test water.

㉜ Page 3-14; column 2; paragraph 2.
Deficiency: What is the source for water quality standard upon which Northern Tier bases their 5 to 1 reduction of toxicity for treatment of bacteriacide in hydrostatic test water before discharge?

㉝ Deficiency: What is water source and availability of maximum amount of water required for dilution of hydrostatic test water five parts to one for toxicity reduction before return to discharge stream? This would require 5 x 7,480,000 gallons for this reduction.

㉞ Deficiency: What volume and impact would discharge rate 1 cfs of hydrostatic test water have on Siebert Creek flow at seasonal minimum and maximum flow rates for Siebert Creek. Temperature effect related to same and impact on fish, plant and marine life? What months would water be discharged and at what specific site location into Seibert Creek?

㉟ Deficiency: What is source of Northern Tier assumptions for hydrostatic test water discharge rates and temperature change assumptions for both SiebertCreek and Strait of Juan de Fuca?

㊱ Deficiency: What would be impact of toxic hydrostatic test water leak at tank farm or from submarine pipeline leak or rupture spilling toxic water into Siebert Creek, Strait of Juan de Fuca, Port Angeles Harbor or seeping into ground at tank farm?

㊲ Deficiency: What would be factor of determinination for choosing Siebert Creek rather than Strait of Juan de Fuca for discharge hydrostatic test water or vice versa?

㊳ What is basis for claim hydrostatic test water can be discharged into Strait at faster than 1 cfs with no impacts? What specific site location into Strait would be used?

㊴ Page 3-14; Column 1; Paragraph 1.
Deficiency: What is preventative plan for inadvertant discharge tank farm hydrostatic test water treated with inhibitor and bacteriacide causing water quality degradation to surface and/or ground water and wells in the area?

㊵ Page 3-14; Column 1, Paragraph 2.
Deficiency: Replacement material for soil removal at tank farm not specifically identified but classified as low permeability. What effect will oil spill from simultaneous rupture of two or more tanks during operation have on land area tank farm and groundwater and wells?

㊶ Question/deficiency: What and how much corrosion inhibitors and bactericides will be added to pipeline and/or tank farm test water? Provide details to back up the statement that a 1:5 dilution factor is all that is required before discharge.

㊷ Section 5.1.7; Page 5-5; Paragraph 1.
Deficiency/question: The Harbor presently has a class A water rating. What will Northern Tier's port proposal do to water quality rating? Will Class A rate still exist? If not what class rate will the Harbor have because of degradation?

㊸ Section 5.1.4; Page 5-3; Paragraphs 2 and 3.
Question: What effect will pile-driving have on stability of Ediz Hook?

㊹ Question: What will be the air borne PHC contamination from off loading tankers, and fuel barges, to the salt water be at end of Ediz Hook, Green Point, Dungeness Spit, Heine Bank and Port Townsend?

㊺ Question: What is the level of PHC entering the Harbor now from the local sewage treatment plant, and what will it be when tanker 1, tanker 2 and tanker 3 go on line?

㊻ Section 2.1.1.7; Page 2-20.
Question: Water in Port Angeles harbor no longer receives sewage effluent; please correct page 2-20. Also, the mills have gone to great expense to remove wastes from the water. The DES should reflect current water quality. Since this clean up we now have a shrimp fishery back in the harbor as well as good salmon fishing. Damages to these resources should be included in the costs of the project and the public should be provided with restitution such as replacement of the damaged resource. Will there be any compensation available in the case of deterioration of water quality caused by oilport-related development and operations?

㊼ Section 1.4.
Omission: The separator for runoff and oily wastes: how much dissolved oil will be discharged into Port Angeles Harbor? What is the total volume of such oil-contaminated effluent? What toxic substances are present (e.g. benzene and other toxic hydrocarbons)?

Of particular concern is the method proposed by Northern Tier to handle runoff and oily wastes. Packaged oil-water separators will be installed on each platform to process the wastes which have been caught in a holding tank. The separator effluent will be discharged into the harbor below mean lower low water level and the oil residue will be injected into the crude oil unloading lines for transfer to the Onshore Storage Facility. It would appear that close consideration must be given to the use of these devices and if they are used, then procedures established for close monitoring in the event of a malfunction to prevent oily waste from being dumped into the harbor.

CONT.

A boom must also be placed around each ship at the time of unloading to prevent the escape of any oil from an accident such as when a hose is being detached. Of equal concern is the refueling barges, if they are used, and the necessity of placing booms and other protective devices into operation whenever a refueling operation takes place. Bunker fuel, because it has had some refining, is much more volatile and potentially would be much more harmful to marine life.

㊽ Question: What provisions have been made to prevent deterioration of water quality related to the dumping of bilge water from tugs, fuel barges, etc.

㊾ Page 3-15; Column 2; Paragraph 1.
Question: What will be the effect on water quality in the harbor of pile driving for all berths and related structures and for what time period?

㊿ Question: Water quality degradation impacts must be given for each specific method of laying submarine pipelines, either jetting or dredging, not generalized for both methods. Which method of pipeline laying will be used? What is the maximum time for worst cause water degradation?

Error: The narrative does not address the total project (three berths, three submarine lines, etc.).

(51) Question: What is the site for marine sediment disposal, for 1,550,000 cubic yards of earth removed? What are the related impacts for total project as far as excavation?

(52) Question: What impact and significance is there to removal of 500,000 cubic yards of recent marine sediments of the given total? One acre, one foot deep equals 1300 cubic yards. Will removal of a total of 1,550,000 cubic yards of marine sediments from depths of 11 to 16 feet near Ediz Hook shore have an errosion effect on Ediz Hook? Only two submarine lines are discussed in this section. The impacts of three should be addressed!

(53) Page 3-16, Column 1; Paragraph 2.
Question: Why weren't complete physical and chemical analyses performed on core samples to determine the scope of impacts on water quality in the Harbor and Strait?

(54) Section 3.1.6; Page 3-14.
Deficiency: The water temperature will rise in the oilport berth area and along the underwater pipelines to the tank farm. The magnitude of the change and any impact on the ecology should be assessed.

(55) Question: Throughout construction and operation of the project, water quality monitoring should be a high priority. How much monitoring of water quality will be performed on the Dungeness River and other rivers, streams and bodies of water which the pipeline crosses and/or traverses near? What schedule of water quality monitoring will be maintained, and by whom?

(56) Page 3-14; Column 2; Paragraph 1.
Question: What is the source, availability over and above current user needs and maximum daily requirement potable water for three berth tanker installation at maximum operation. What affect would this potable water requirement have on future industrial expansion related to potable water availability?

Note: other comments relating to Port Angeles water supply impacts are included in the "Utilities" section.

W

## WILDLIFE/PLANTLIFE

① Page 3-28; Paragraph 3.
Deficiency: The BLM-DES is inadequate in discussion of waterfowl. The presentation is shallow. It is not enough to simply state "waterfowl will be significantly impacted." More analysis of populations, species and migratory habitat is needed.

Deficiency: Contrary to Northern Tier's assessment, the loss of the waterbird population could be of regional significance. Much more needs to be known of the place of Port Angeles Harbor in the migrant and wintering pattern of birds using the Pacific Flyway. A biweekly 18 point check of the Port Angeles waterfront has shown this to be a prime wintering area. One duck, Barrow's Goldeneye, needs study as to whether the harbor represents its prime wintering area.

In the Port Angeles harbor area one finds large concentrations of Barrow's Goldeneye ducks during the winter. These birds have not been sighted at Dungeness Spit and only rarely in small numbers at other points along adjacent coastal waters. We need to know what part of the total Barrow's Goldeneye population uses our harbor as a wintering area.

On Ediz Hook an observer can see the rare and beautiful hooded merganser, old squaw and harlequin ducks. Here too, the common murre, a remote relative of the penguin, can be found. Particularily impressive are the numbers of grebe, (western, eared, horned and red-necked) who use the harbor during the winter. There are black brant off the Coast Guard station and "rafts" of ducks in winter residence. These include scoter, scaup, bufflehead, common goldeneye, and red-throated loons. A yellow-billed loon, rare in any area, has been sighted and positively identified. Shorebirds too are at home on the Hook. Whimbrel, plover and turnstones use the limited shoreline still available. Some local residents have observed the rare wandering tattler only on Ediz Hook.

Further discussion is needed of wildlife habitat. Located on Dungeness and adjoining Graveyard Spit is a national wildlife refuge. To those who have learned to know this wild, lonely area, it is indeed a precious place. Here live a wealth of "wild ones". (The following information is based on the results of a monthly survey of the Spit carried on over the past two years.) In the spring and summer, gulls, oyster catchers, tern and night hawks can be found nesting. This isolated area provides a place for the seal to have their young. What visitor does not thrill to the sight of these creatures as they curiously inspect the invaders?

Transients include the terns, even Caspian and Arctic, rare in this area, have been identified. Shorebirds by the thousands use the Spit, both as migrants and permanent residents. These include plovers, dunlins, turnstones, gowits, and sandpipers.

CONT. ① However, it is in the winter that one can best note the importance of this area. At that season, it is the home of black brant, widgeon, scoter, common goldeneye, bufflehead and scaup ducks by the thousands.

Not only would the nesting, transients and winter residents of the area be destroyed by an oil spill. Birds whose nests are on Protection Island use the rich waters that border the Spit as feeding grounds. These include the pigeon guillemot, rhinoceros auklet and the tufted puffin.

Northern Tier's only answer to the question of how these birds can be protected has been that they will die or move to other areas, but that ultimately their numbers may possible be restored. The BLM should further consider impacts in this area.

In a large spill, according to Northern Tier's application to the Washington State Siting Council, 73,000 birds could be expected to die within the vicinity of Dungeness Spit. Northern Tier further states that these numbers do not mean much because the numbers would probably be restored in other areas.

Comment: Further examination of BLM should determine what part of the total black brant population actually over-winters in the Straits and the adjoining waterways. With such information a judgement can be made as to whether this species is in danger. The true importance of the entire Straits, Puget Sound and Hood Canal in the migratory pattern must be established before the Northern Tier project should be allowed to proceed.

② Page 2-26; Paragraph 9.
It is stated that no areas of special concern were identified. The Port itself is an important area habitat for migratory birds. Location of the oil port could prove to be a dramatic impact upon these bird species. The statement that there are no areas of special concern is erroneous.

③ Question: A February 18, 1915 Port Angeles newspaper article discusses both Ediz Hook and Dungeness Spit as wildlife reserves created by Executive Order. Does the Ediz Hook include governmental protection for wildlife?

④ Dungeness Spit is a low, fragile ribbon of sand, logs and grass. If this pristine, totally unique area is to remain, the BLM must thoroughly consider the effect of the proposed cutting into the loose, glaciated soils of the bluff at the proposed tank farm site and how this activity will affect the Spit. What are their plans to control the sediment that will be carried eastward toward the Spit when the high bluff is opened to erosion? Even now, in its relatively undisturbed state, the rate of recession is given as three inches per year. What will the construction of a facility to lift the oil to the top of the bluff do to this rate? Northern Tier proposes a 100 foot buffer zone at the top of the bluff. This is the width of two ordinary city lots, hardly an adequate arrangement. Much more needs to be known about the effect of this construction and the resulting erosion on Dungeness Spit.

⑤ Page 5-6; Paragraph 8.
"Spills might attract these birds . . . a significant local impact." Impacts on bird populations would be regional not only local. Whole populations may be impacted during migratory movements and impact the total national resource.

Deficiency: The BLM-DES should have identified and discussed in detail total state-wide populations data and migratory habitats of water birds that might frequent Ediz Hook and Dungeness Spit. At some periods, the bulk of the total species population may be at the Dungeness Spit during migratory movements and a major oil spill could wipe out the population. Total population numbers, migratory habitats and critical times should be entertained in analysis.

Page 2-88; Paragraph 8.
Deficiency: Distribution and general background information on marine birds is inadequate. References to maps may be wrong (Map II-9). Population distributions per seasons and migratory movements are critical to proper analysis.

Deficiency: Northern Tier estimates that a catastrophic spill contaminating Dungeness Spit could involve 73,000 birds. Therefore, studies are essential to find out to what extent Dungeness Spit and adjoining areas represent the main wintering grounds of black brant.

Question: In what specific regions does Northern Tier at present time propose realigning its route to accomodate protected endangered fauna and flora?

⑥ Deficiency: Northern Tier states that contaminated soil will have to recover naturally. In small spills affected areas can be cleaned up by removing oil and contaminated soil. Whose responsibility is it to clean up is not clear, nor is any responsibility assumed by Northern Tier for vegetation destroyed. The BLM should address this concern.

⑦ Deficiency: The impact of the construction should be further assessed, not only on the flora and fauna endemic to the area, but its influence on the transitory visitors to the area, i.e. birds and some marine mammals, of the coast flyway when significant migrations are seen during the year. They may utilize other sites, though the space available is finite, locals will be denied ready access to viewing and study. The loss of an important recreational program, not to mention unknown effects on migratory habits must be evaluated thoroughly.

⑧ Section 5.2.3; Page 5-13.
Omission: There is no discussion about construction noise impacts on fish and wildlife. Depending on timing and location the noise level could have significant impacts on nesting, rearing or wintering to numerous species. This aspect has numberous ramifications and should be expanded.

⑨ Section 7.4.2; Page 7-2. Omission:
Irretrievable loss of bird life because of small chronic spills should be addressed. The discussion of bird use and potential impacts in Port Angeles Harbor are weak throughout the statement.

Page 3-30, Photograph.
Omission: Gulls are not classified as waterfowl.

Page 3-32; Column 2; Paragraph 1.
Comment: Birds. Floating islands of oil attract small fish, which are the food stable of most marine birds. The birds go under the oil mat to feed, then break water through the mats and get oiled. The right-of-way would also destroy an important riparian habitat and adversely impact an upland game bird nesting area.

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⑩ Page 2-26; Paragraph 7.
It is stated that no bald eagle nest has been sited. This is incorrect. According to local residents there has been a nest sited that is suspected to be an eagle nest. Furthermore a pair of eagles has recently been observed in the area.

Page 3-32; Paragraph 10.
Deficiency/Omission: Again the discussion of migratory birds is inadequate. Eagles should also be monitored due to the event of an oil spill. Eagles in the vicinity may be impacted when feeding on shore organisms. Harris, 1958 presents a discussion indicating that eagles feed on marine organisms. (Harris, 1968, Otters)

Page 3-35; Paragraph 6.
Question: The statement, ". . . displace bald eagles", is misleading. Eagles may not be able to relocate. Where will they be displaced to? More analysis should be implimented to research this.

Page 3-35.
Omission: Construction phase. There is no discussion of possible summer use by bald eagles. There is a serious concern that disruption of the eagle nesting territory which is necessary for hunting, perching, flight training of young, etc. would cause the eagles to abandon the nest site. This needs to be investigated and discussed in far more depth.

Deficiency: The migratory birds are most often water birds and this important flyway stop could present a lethal situation for many.

⑪ Omission: Certainly many hundreds, and more probably thousands, of migrant, wintering and even resident birds will be significantly affected by any massive development in the Port Angeles Harbor, and especially along the inner (sheltered) portion of Ediz Hook. For just as human interests and development is attracted to its shelter from the outer, open waters of the Strait of Juan de Fuca, so are wildlife and particularly birds. This can be stated as fact by a simple observation of the area and obvious birdlife at any time, with no formal scientific inquiry and confirmation necessary.

Yet throughout this preliminary environmental statement there is no mention even of this plain wildlife fact that will certainly be affected somewhat, at the least. An obvious conclusion is that some professional, detailed investigation of this obvious wildlife problem and its ramifications should be a priority environmental concern. Moreover, it should precede and importantly influence any development plans.

While Ediz Hook and the harbor are not known as an important nesting area for birds, they may be even more important as critical sheltering habitat for thousands of migrant and wintering birds of many species. No longer can we innocently contend that they may simply have to move elsewhere. Biologists now realize that suitable places are no longer a dime a dozen.

⑫ Page 2-22; Paragraph 5.
Deficiency: Any of these habitats, as designated by Canada, encompassed in any of the hypothetical oil spill trajectories pages 3-20 to 24 should be mapped and discussed.

⑬ Deficiency: Page 2-25; Table 2.1.1.7-7. Both salt marshes and eelgrass beds are areas of high benthic, invertebrate and detrital production. Low evaluation of both gives the general impression that these habitats are of low value to birds. If mud means mudflats BLM has left out many birds that feed on the organisms and vegetation that lives on mudflats. The U. S. Fish and Wildlife Service supplied a number of materials sources that were apparently not used.

Deficiency: Waterfowl use areas should be more descriptively displayed. This should include winter concentration areas along Hood Canal where there is a possibility that an accident could affect open waters and identified harlequin, bufflehead, and wood duck nesting areas in the streams to be crossed. Migration routes should be more thoroughly discussed.

Page 3-15, Paragraph 4.
Deficiency: Ediz Harbor is wintering area for sea ducks and other water birds. Frequent spills could cause bird oiling which would stress birds and increase rate of mortality.

Page 1-58.
Deficiency: The pipeline and storage facilities will be allegedly designed to avoid ecologically sensitive wildlife habits - including preservation of the Bald Eagle roosting area at Green Point.

⑭ BLM's own studies show (3.1.9, Page 3-35)"impacts on wintering Bald Eagles at proposed storage facility would include abandonment of roosting sites and possible abandonment of shoreline feeding and scavenging areas." This is hardly preservation and would indicate that the applicant has no real desire to preserve any habitat for endangered species - also a pipeline would reportedly impact a known eagles nest at Dabob Bay and the Nisqually Delta.

Table 2.1.2.9-1.
Deficiency: For Green Point four eagle sightings are given and they list Green Point as a possible winter roosting area. Casual observations of local residents show this is a gross understatement. Since January 29, 1979 there have been 57 individual sightings of Bald Eagles in the Green Point area and nearby bluffs. These observations are not intensive, i.e. they have been notes when an eagle was observed although there was no searching for eagles. Sightings ranged from one minute, as an eagle would fly along the bluffs, up to one hour and ten minutes of roosting in a snag. Since mid February there were five occasions when pairs of adults were seen together, either roosting side by side, or flying together sometimes in intricate manuvers. Fourteen of the sightings were immature eagles and a few were noted to be acquiring adult plummage.

The Green Point area is used more frequently by Bald Eagles than either Northern Tier or the Bureau of Land Management has indicated to date. Indeed, the Green Point area should not be separated from the nearby coastline for the eagles feed, roost and nest along the coastline, as dead fish are their major source of food. Hence the eagles would not only be impacted in the Green Point area but the pattern of life along the shoreline could be disrupted.

It would seem that in Washington, being only one of three states where the Bald Eagle enjoys a "threatened" rating every effort would be made to hold at or improve present eagle population to prevent them from becoming endangered. With increased development along the coastline the entire area is in danger of losing its eagles.

CONT.

⑭ The BLM lists Green Point as a winter roosting area. Their own data shows there was little effort made to determine if in fact there are nesting eagles at Green Point or nearby. The absense of an easily identified nest does not rule out a nest. Residents of Green Point have seen eagles throughout the spring and summer. Two of them last summer observed adult eagles breaking dead branches off trees - probable nesting behavior. Because no record of a nest exists on any state or federal report doesn't preclude a nest in the area. State officals and a BLM wildlife biologist were eager for me to do as much observing as I could and would seem to indicate a factual report on eagles at Green Point doesn't exist.

Page 3-84; Paragraph 5.
Deficiency: The statement, "worst case situation . . .bald eagles . . . four active nests . . ." This is hardly a worst case analysis. It should be considered a conservative analysis.

Page 4-4; Paragraph 13.
Deficiency: Buffer zones for eagles is a token effort. Areas with eagles should be avoided. Eagles are a threatened species and a symbol of our national heritage.

Page 5-7; Paragraph 1.
Deficiency: Again, the DES states eagles will relocate. This is misleading. Eagles may not be able to establish new territory.

Page 6-2; Paragraph 7.
Deficiency: With respect to Bald Eagles. The author of the DES may know of alternative habitat being available nearby, but how do we tell the Bald Eagles that?

Section 2.2.1.9; Page·2-155, Column 1.
Deficiency: This statement is not completely valid. Because of threatened species classification, eagles can be protected under State and Federal laws from routine types of developments. See page 2-26 comments.

⑮ Page 5-3; Column 1; Paragraph 1.
Omission: Noise would also effect eagles and other wildlife species. The lack of identification of noise impacts to fish and wildlife resources implies no impacts. This is not a realistic presentation of the situation.

⑯ Comment: Peregrine falcons have been sighted at Dungeness Bay. There are roosting trees for them near Jamestown Beach. Birds of concern from the Audubon "blue list" (birds which are threatened) and which are present on the Olympic Peninsula are: The Redneck Grebe, the Western Grebe (both highly susceptible to oil damage since they sleep on the water), the Canvas Back, Sharp Shin Hawk, Cooper's Hawk, Marsh Hawk, Osprey (a summer reisdent with a couple of nest sites known on the northern part of the Olympic Peninsula), American Kestrel, the Pigeon Hawk, the Common Tern which migrate through Dungeness Bay, the Short Eared Owl, the Hairy Woodpecker, the very rare Western Bluebird, the Yellow Warbler, and the Warbling Vireo.

⑰ Deficiency: Regarding marine ecosystems, the sections generally need to be more definitive. Terms such as "probability" and "generally" are commonly used. The lack of definitive responses points out the inadequacy of background research and study. While some undefinitive answers might be expected when analyzing ecological systems because of the state of the art, the study should not be plagued by them.

There is a general lack of discussion regarding ecological relationships and a picture of the total system and subsystems. Particular interest should have been given to trophic levels and food relationships. Much more study and research could have been initiated in this area.

Deficiency: Throughout the sections on construction impact, the constant use of terms such as "not expected", "will probably", and similar vague phrases, clearly imply a "guessing" element is being utilized.

Deficiency: The rocky western shore of Freshwater Bay through to Tongue Point is currently the Peninsula College's most important study site. No subtidal area is now being considered for a marine preserve: any oil spill would be a disaster for a study site of over 40 years standing.

⑱ Page 2-22; Paragraph 4.
Deficiency: Under threatened and endangered species there is no mention of sea otters in the Straits. According to Estes and Palmisano, 1974,1060, and Kerr, 1975, 50, game authorities have introduced others to Washington and Oregon coasts. Previous domain of the sea otter was the entire length of the west coast including the Straits. Monitors should have been given this topic. There have been local residents reports of sitings on the Straits. The sea otter is an endangered species. Kerr, 1974, Threatened Wildlife. Estes and Palmisano, 1974, "Science" volume 185, Number 4156, pages 1055-1060.

Page 3-32; Paragraph 9.
Deficiency: The statement to sea otters is misleading. Kerr, 1974, states the biggest threat to sea otters is oil pollution and possible contamination of whole populations by a major spill. Kerr, 1974, Threatened Wildlife. The paragraph understates this potential.

Page 2-88; Paragraphs 9 and 10.
Deficiency: Paragraph states no endangered mammals are located in the Straits. Sea otters may be located here and should be discussed (see earlier comment).

Page 5-6; Paragraph 9.
Deficiency: Seals and other marine mammals could be severely impacted. The BLM statement conflicts with a statement on page 5-17, "little is known about the effects of oil on seals," paragraph 5.

⑲ Page 3-32.
Error: Pinnipeds is misspelled six times. The two paragraphs discussing impacts on sea mammals indicate that seals and sea lions are subject to impact from oil spills. Page 5-7 says that they have been sighted near oil spills, but they do not become contaminated. Which of these contradictory statements of fact is accurate?

Deficiency: The DES states that construction and operational activities would not adversely affect the use of the harbor by marine mammals.

CONT.

⑳ The BLM should further consider:

1. Deterioration in the food chain caused by the destruction of eel grass beds, temporary and permanent, by bulk heading and the addition of rip rap to the harbor side, as well as damage of minor day-to-day spills. These beds are limited, but this increases their value as food to many creatures.
2. The applicant has stated that "we do not know much about the biology, or life history of marine mammals." How, then can we assume that, as Northern Tier suggests, they will avoid contamination and move to other areas? A question remains, where?
3. Increased use of the harbor and heavy traffic would seem to create greater restriction or possible preclusion of the harbor as a habitat area for marine mammals.

Research should be initiated to consider the impacts that similar facilities have created regarding marine mammals usage or habitat access.

㉑ Section 2.1.1.7; Page 2-22.
Error: No endangered or threatened mammals found in the Strait of Juan de Fuca, etc., is wrong. Gray whales are found here. They are observed every year--as far into Puget Sound as Hammersby Inlet, and along the way. They come into bays and harbors to feed and/or scrape off parasites.

Section 5.3.4.2; Page 5-20.
Question: Eel grass areas which are lost should be transplanted. Local expert on transplanting eel grass is Ron Phillips. See "Oceanus" Volume 2, Number 3, 1978, pages 30-40.

㉒ Page 3-26; Paragraph 2.
Deficiency: The statement ". . . those beds should . . ." illustrates the need for more analysis. The eel grass beds are important in marine systems. The eel grass beds are a limited resource and should be protected.

Comment: The existing regional eel grass beds would suffer significantly from any oil spills. The fact that the zone is so small and is restricted, is a significant reason for its protection. Information is needed regarding the loss ratio for log rafts, etc., relative to eel grass maintenance. The alteration of depth and subtrate will lead to permanent loss of existing eel grass beds.

It is obvious that the eel grass strip will be lost along with its support base for many small invertebrate forms, i.e. gastropods, etc., these groups do serve as a food base for many of the fish in the area. The loss of the eel grass and any kelp stock may well influence animal patterns and will likely alter the stability of the (subtidal) area as well.

Deficiency: The document states the eel grass beds are narrow, but neglects to state the total habitat area in quantitative terms. How many total acres exist? More studies need to be initiated on this point so the impacts regarding loss of the allegedly insignificant habitat space may be identified.

Deficiency: The statement ". . .certain oceanographic and meteorological conditions . . ." should be more specific. More analysis is necessary.

Page 5-5.
Omission: More attention should be given to long term exposure by minor spills and everyday activity and contamination of marine organisms and resources. The analysis in this area is inadequate. More study, research and investigation are warrented.

㉓ Page 3-32; Paragraph 1.
Deficiency: The statement ". . . 300 plankton could . . ." illustrates inadequate research and study has been performed. Zooplankton do play a major role in the food web, and more specific information is justified from BLM in the analysis.

Deficiency: The 65 foot minimum buffer zone along Siebert Creek and 100 feet minimum along the bluff should be questioned because of the erosion prone soils. Northern Tier states that the bluff is receding 3 inches per year. With added stress of construction of the "lift" to the tank farm, the effulent separator drain, we might expect the rate of recession to increase. This added sedimentation should be a source of concern to marine fauna and flora. Further, can vegetation be maintained in the buffer considering the unstable soil conditions, and the affect of tank farm gases. Construction of holding basins needs to be clarified. Where will the waters collected be discharged? How will sediments be kept from reaching the Straits?

Page 5-17; Paragraph 11.
Omission: The statement, ". . . long term effects are not well understood," illustrates a lack of research and study. Marine resources are a main topic of concern and deserve proper analysis.

㉔ Page 2-26; Column 2.
Deficiency: The onshore storage area is part of a limited forested ecosystem that exists in the immediate vicinity. Each year more of this ecosystem is destroyed by housing developments, etc. This diminishing area is the habitat for a number of game and nongame species that are of concern to Washington State and Clallam County. Any diminishing habitat is an area of concern. The document does not adequately discuss terrestial vegetation or nonendangered species wildlife. There is too much dependence on the map addendum to document environmental values. This is not detailed or site specific enough to determine specific impacts.

Section 3.1.9; Page 3-35.
Deficiency: Coverage of resources is inadequate throughout the statement. There is more to wildlife than endangered species. Also there are some important managed species in a diminishing habitat. This type of coverage implies a low wildlife value in this area which is erroneous.

Page 3-35; Paragraph 1.
Deficiency: The BLM refers to "more suitable areas." If a habitat is suitable it will already be occupied. Somewhere along the line crowding and displacement will occur. Unless you want to demonstrate this sequential bumping or pecking order displacement for the peninsula, you might drop this concept and identify displacment losses.

㉕ Table 2.1.2.9-3; Page 2-100.
Deficiency: Formating technique does not adequately address major species concentrations or general seasonal distributions.

CONT.

㉕ There are numberous areas of special concern across Washington. The entire east slope of the Olympic Mountains is a significant big game habitat for Roosevelt Elk, mountain lion, mountain goat, black-tailed deer and numerous smaller riverine dependent mammals. The mouths of all the streams are important wintering areas for waterfowl.

Deficiency: The number of animals losing their habitat as a result of the tank farm could be significant. The study of the affect of the tank farm on terrestrial plants and animals is incomplete.

Northern Tier states that long term displacement of wildlife can result from maintenance of the pipeline corridor. We need to take a detailed look as to what area in our county the 75 - 90 foot corridor will cross.

We well know that loss of a rare swamp habitat can never be replaced by back-filling a trench and spraying on green paint and grass. It is the loss of habitat that makes common species into rare ones. The United States has witnessed the repeated loss of animals and plants which were once abundant, through just this kind of irresponsible behavior. Construction, oil spills, and air, water, and soil population all have their adverse effects on plants, animals, the local economy, and the people's health and welfare. More study must be conducted in this area of concern.

㉖ Omission: No analysis is given regarding air pollution and its impacts on flora. This could be a significant impact and it is not even dealt with in the DES.

Note: for other comments regarding the effects of air pollution of plantlife, see the "Air Quality" section of this report.

Page 3-28; Paragraph 10.
Deficiency: The statement that it is, " . . .almost impossible to give a general discussion of such topics . . ." is inadequate. An environmental statement dealing with this important subject must detail impacts. A general discussion is not acceptable.

Page 2-95; Paragraph 3.
Deficiency: The statement that ". . . available data are insufficient . . ." is similar to other statements throughout the text which are inappropriate for an environmental statement, and justifies further research and study in this field.

Deficiency: References to justify unavailable impacts section are bleak or nonexistant. Proper referencing should be required. The validity of the statements are almost impossible to check.

Page 4-3.
Deficiency/omission: The statement that ". . . effectiveness . . . cannot be determined . . . applicant has not stated . . ." is not appropriate. How can impacts be analyzed and mitigating measures discussed when such information has not been established.

Page 4-4; Paragraph 1.
The paragraph should refer to pages to make the reference easier to access. The presentations in chapters 1 and 3 was not adequate. Discussion should have been more specific listing species and management plans.

Page 2-96; chart.
The consulting firm of ERT is sited at this section. Other data should be presented. The applicants consultant may be biased.

Page 3-15; Paragraph 3.
Deficiency: The statement "Water quality will be degraded for 3 months" should be documented. The NTPC is cited as a reference.

the east side of the Peninsula: Deer Cabbage, Golden-eyed Grass, and Swamp Gention. Six do occur on the west side of the Olympic Peninsula, along with others not even on their list, but, being herbaceous, are not apt to be recognized in early spring.

Deficiency:
It is nearly impossible to determine the pipeline route from either the text or the map. One can only guess where sensitive habitats may be encroached upon. There are, along the route, many rivers and streams. At each crossing there are dangers of siltation and of irreparable damage to marshy margins, estuaries, and rock outcroppings, all of which are sensitive habitats, often with rare plants.

㉗ Section 3.1.8; Page 3-34.
Deficiency:
A contradiction appears to occur when BLM states there are no threatened or endangered species in summary but differently in discussion, see page 3-7 (top paragraph).

㉘ Page 3-34
Question: Is there documentation for the statement that no vegetation grows naturally on Ediz Hook? Applicant should cite source, data, etc.

㉙ Deficiency: Ediz Hook has a wide spectrum of beach plants. Among the many species which have been collected there are Menzies' Tall Peppergrass and Pink Sand Verbena. Both of these plants are listed in A Working List of Rare, Endangered, or Threatened Vascular Plant Taxa for Washington, Denton et al. Perhaps Norhtern Tier ecologists should take a closer look at both Ediz Hook and the plant list.

㉚ Comment: Forest-type generalities are not enough. There are approximately 1,450 established species of vascular plants on the Olympic Peninsula. The Northern Tier study only mentions 50 (9 trees, 13 shrubs, 2 ferns, the rest herbs). Obviously, there are vastly more than 50 species in the lowlands of the north and east sides of the Peninsula. Such a lack of understanding of our flora can scarcely prepare Northern Tier to safeguard our environment. There is a greater variety of species on the roadside of Highway 101 between Port Angeles and Sequim than in their entire report). The relevant sections should be further addressed.

㉛ Deficiency/omission:
Plant studies related to the NTPC project have been inadequate to date, particularly those conducted by the NTPC or its agents. For instance the months for study were poor choices. February and April are not the season! What do these dates say about the real concern of Northern Tier? Most herbaceous plants cannot be accurately identified without either flowers or seeds. It is small wonder, then, that there were reported to be virtually no plants at all on Ediz Hook, that only about 30 species out of hundreds were ever identified, and that no rare plants at all were found.

Northern Tier must be required to do a real study, in the proper season, and with close attention to sensitive species and habitats.

The designation of Olympic National Park by UNESCO as a Biologic Reserve Area is a result of its rich species diversity. As such a reserve the area would serve as a repository for genetic material to reconstitute damaged and depleted parts of the world. It should be totally unacceptible to allow air pollution and particulary oxidant type air pollution which can damage genetic materials, to degrade air quality in this park.

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32 Section 2.1.2.8; Page 89.
Deficiency: Entire section is too general. It is impossible to evaluate impacts from such a description. The classification systems are too broad to evaluate.

Section 1.4.
Deficiency: In discussing maintenance please include details for brush control: herbicides? (type?) burning? mechanical control? In pipeline construction trees, brush, crops and boulders will be removed. Where do the boulders go? Vegetation. Native grasses removed during construction may not be replanted by the pipeline company and inferior grasses may take over.

Page 2-89.
Comment: The Olympic Peninsula is noted for diversity of plant and animal life. The golden chinquapin is well known on the Olympic Peninsula and probably occurs along the pipeline route.

33 Rare and endangered plant species on the Olympic Peninsula would also include the following: Arctostaphylos x media, Calypso bulbosa, Eriophyllum lanatum var. achillaeoides, Erythronium oregonum, Hemitomes congestum, Lipidium virginicum var. menziesii, Scirpus cyperinus, Sedum lanceolatum var. rupiculum, Botrychium virginianum, Chrysolepsis chrysophylla, Eburophyton austiniae, Plantago macrocarpa, Bromus vulgaris var. eximius, and three Clarkia amoenas (var. pacifica, var. caurina and var. quadrivulnera), Puccinellia pauciflora var. pauciflora, Shepherdia canadensis, Abronia umbellata var. acutalata (found on Ediz Hook), Bromus sitchensis var. sitchensis, and Juncus gerardii.

34 Page 3-34.
Deficiency: Is 140 acres total vegetation removal at Green Point for total project with 25 tanks and 1.3 mbpd throughput?

Error: Green Point zoning prohibits industrial development or industrial timber management or production in a residential/agricultural zone. Erroneous impression is given in justifying removal of vegetation on basis of area not under commercial timber production.

Northern Tier professes special concern for twelve species of rare or endangered plants. We are assured that none were found along the pipeline route. That is hardly surprising, as three of their twelve do not occur on the Peninsula at all: Hovellia, Yellow Lady's Slipper, and Northern Grape fern. Three are not known to occur on

This firm, under contract to NTPC may have a bias. More references should be given.

Page 3-84; Paragraph 4.
The environmental inspector proposed as a mitigating measure is a token gesture. Who would be the environmental inspector? What qualifications would the person have? Would there be one for every work crew? To state, ". . . if that inspector were a botanist . . ." raised a question of credibility. There should be no question that persons in these positions be qualified.

Page 4-4; Pargaraph 9.
Deficiency/omission: The statement ". . . consider them (mitigating measures) when recommending or issuing permits," is not appropriate. One of the major purposes of NEPA was to establish a mechanism by which mitigating measures could be researched and developed. The ES process is the mechanism for such analysis. To exclude such discussion is a significant deficiency.

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## GENERAL COMMENTS

This section outlines many of our concerns about the adequacy of the entire BLM-DES. Does it comply with the federal and state requirements for environmental statements? Is it complete? Are its findings documented and substantiated? Is it objective? In all, is it a document upon which a decision to grant the Northern Tier Pipeline Company a federal permit can be made?

### Compliance with Statutes

1 Section 1.6; Page 1-63.
Deficiency: No recognition is given to state and local statutes. Although these do not need to be enumerated, it is important to note that Title V, under which this DES is expedited, is a federal expediting authority and does not preempt or expedite state and local government permitting processes. Additionally, the Federal Land Polity and Management Act (43 U.S.C. 1701) gives further authority to the state siting process. Specifically, Section 1765 "require(s) compliance with state standards for public health and safety, environmental protection, and siting, construction, operation, and maintenance of or for rights-of-way for similar purposes if those standards are more stringent than applicable Federal standards. . ." (emphasis added).

Yet, the NTPC permit application is not in compliance with State standards. An independent consultant retained by the Washington State Energy Facility Site Evaluation Council found that the applicant's site certification application was deficient in January 1979. Furthermore, the consultant found that it was not possible to do an adequate DEIS due to the inadequacy of the application. (Attached Transmittal: CH2M Hill to EFSEC, 1-31-79)* It was the opinion of the State consultant that "it does not comply with SEPA guidelines for draft environmental impact statements and would not be in the state's best interest to release a DEIS with such serious flaws." It is significant that the State consultant had the benefit of BLM's DES and still found the project application substantially inadequate for environmental assessment.

This DES may sacrifice substantial compliance with NEPA but it should note that Title V does not preclude State from requiring substantial compliance.

- Attached at the end of this General Comments section.

### Completeness

Inadequate time was available to formulate an adequate draft environmental statement for a project of this size, particularly because of the numberous impacts and alternatives involved.

Deficiency: On each occassion of BLM Coordinating Committee meetings, various representatives of federal agencies, including BLM team members, stated concerns regarding: 1) the lack of sufficient data available for proper analysis of the project and related impacts and 2) pressure of established time constraints, stating concern for lack of usual time

CONT

needed for evaluation. BLM officials stated that they weren't pleased with a substandard product, but they had to proceed regardless.

2 Question: In several circumstances the BLM states that various studies, though needed, were not available. However, in some of these situations, Task Force members were able to locate relevant studies. Why did the BLM leave out Canadian Marine resource information which was readily available to the BLM team? Why were not at least the preliminary findings of the Department of Energy Supply and Demand Study included in the BLM-DES? Preliminary information was available to the BLM months before the draft was written.

Error: The few portions of the Department of Energy study to which reference was made in the DES do not present a fair transmittal of the major finding of that study. The DES fails to illustrate that the shortfall of crude oil supply in the northern tier states is very significantly less than the volume for which the NTPC project is designed.

3 Deficiency: This document tries to state the impacts of a project which has not yet been defined. Changes in the proposal have been made continually since the original application; and, even today, the application is neither final nor complete. The harm done by not having a completed application is reflected in the statement: "When quantification was not possible due to a lack of specific information, a range of values was assigned . . ." Detailed construction and operation plans have not been completed (page 3-1) and, with regard to mitigation measures, ". . . it cannot be determined with certainty how or where some of the measures would be applied." The NTPC plans are still undergoing major revision.

4 Page 1-54.
Deficiency: The statement that environmentally sensitive areas will be identified after the start of construction (when the ES is complete and all permits have been issued) violates the intent of NEPA and SEPA. Similarly, "Development of a reliable pipeline leak detection system." "Development of an effective fire protection system for each operation location." "Determination of final locations for the pipeline system, stations and delivery facilities" and the other items mentioned on pages 1-54 and 1-55 should all have been known prior to the issuance of the DES.

5 Question: The BLM, in its evaluation of the NTPC proposal has not addressed the impacts and consequences of the proposal on our Canadian neighbors across the Straits of Juan de Fuca. Does not the National Environmental Policy Act and the Clean Air Act require consideration of the national and international environment?

Comment: Because of the impacts of the NTPC project upon Canada, notably to air quality, water quality, and marine resources, the BLM should conduct at least one public hearing in British Columbia.

6 Deficiency: Little analysis is provided of the social impacts of the proposal. The character and lifestyle of area residents should be analyzed and related to the impacts of the proposal. Probable secondary developments should be evaluated also.

### Documentation

Deficiency: In many cases reviewers found a need for documentation of statements in the DES. Several of the references cited are not available to the public reviewer. Some data cited was very inadequate in a few cases, Task Force members obtained much more relevant data than that which the BLM utilized.

The document should be more precise throughout. For example, the following statements appear regarding the onshore storage facility:

1. ". . . might increase the potential for slope failure."
2. ". . . would be located on nearly level terrain with very little probability of slope failure."

The DES should use more precise and meaningful terms than "might increase" and "very little probability." These statements are descriptive, but they do not provide enough information to make a rigorous assessment of the impacts.

### Worst Case

State and Federal regulations require that the worst case impacts be used in judging the project, when specific information is not available. Throughout the Environmental Statement the impacts of a three-berth port with the 1,283,000 bpd throughput, third submarine pipeline, and additional tank storage should be considered in the same detail as the 709,000 and 933,000 bpd levels of development. Instead of being buried in the relative obscurity of Chapter 6, this information should be fully described, analyzed, tabulated and charted in Chapters 1, 3, 4 and 5 concurrently with the other two capacities in a [illegible] that provides easy comparisons. NTPC agents are on public record stating that the third berth and higher throughput will be in operation within three years. Does not the National Environmental Policy Act require a thorough analysis of such foreseeable expansion of the proposal?

### Recent Changes

Deficiency: Several major, significant changes have been made in the NTPC proposal since the BLM-DES was published. Some of these changes are as follows:

1. Change to a Cross-Sound pipeline route.
2. Extension of the off-loading facility into the full U. S. Coast Guard base area on Ediz Hook.
3. Bunker fuel storage system and location of facilities.
4. The pipeline approach through the bluff to Green Point.
5. The loss of the Hood Canal Bridge. (This latter change is, of course, not part of the NTPC proposal. It may, however, have a significant impact on construction plans such as materials supply routes and commuting worker transportation.)

CONT

7 There has not been sufficient time to analyze and comment on the implications of any of these changes. Since these changes were made after the public hearing on the BLM-DES, there has been no public comment period as required by law. This negates the entire public participation thrust of The National Environmental Policy Act.

It is also significant to note that no public hearings have been held in Island and Snohomish Counties. These counties would be greatly impacted by the adoption of the cross-sound pipeline route, and they should be included in the public preview process.

8 Section 3.1.15; Page 3-55.
Deficiency: The DES states, "Opponents of the project would be highly sensitive towards any noticable changes to these (air) resources brought by the oil port. Impacts would be magnified for them." Also, "Small chronic spills would occur frequently with little noticeable impact. Opponents of the oil port would be highly sensitive to any noticeable oil in the water or on the beach, and for them any impact would be significant."

These statements reveal bias on the part of the ES authors. The DES is supposed to measure the objective impacts of an oilport. To say that impacts would be "magnified" for opponents implies that they can be "miniturized" by proponents. Objectively, an impact is either significant or it is not. It is implied here, however, that impact is determined by the attitude of the observer.

### Other Comments

Comment: The physical size of the document is a significant impediment to thorough impact assessment. Its size and bulk have prevented some people from reading its contents. The document is too large, heavy, awkward. It will not fit into most copying machines. The pages come loose easily and get bent or lost. Persons reviewing the document could be more thorough if it were printed in a more managable size.

Deficiency: The ES is not well organized. Information on specific topics is scattered throughout the document, making careful analysis unnecessarily difficult.

Deficiency: The Summary document is very poor. It simply fails to be an "objective summary" of the main document. The Summary's brief discussion of the project impact understates the findings presented in the main document. This is especially significant and unfortunate since 1) our reviewers feel that the main document already seriously understates the total adverse impacts of the project, and 2) many people are likely to read only the Summary.

Deficiency: The quality of most of the photographs of the Port Angeles area is poor. The location from which several photos were taken does not depict the subject scenery in its most representative nature. For example, several of the harbor photos barely show Ediz Hook and certainly obscure its obvious aesthetic value and prominence. Several photos depict a haze hanging over the harbor which is not typically the case.

Deficiency: The stated purpose of the applicant is contrived in such a manner as makes it difficult or impossible for other alternatives to compete on an equal basis. Several of the other alternatives, when taken in combination, appear to fulfill that stated purpose with far less environmental and financial cost and with equal efficiency. Any conclusions drawn from the Draft ES must be drawn with the realization that equal or better proposals are available. The Draft ES should state this clearly, probably in Chapter 1 and at appropriate locations throughout the document.

Deficiency: The BLM seems to be relying on the Map Addendum to document environmental values when there should be more detailed discussion of such values throughout the narrative. Specific sites, quantification, seasonal variances, etc. are often difficult to depict graphically. There are significant inadequacies in this regard within the BLM-DES Map Addendum and the narrative section is often a weak complement. While graphics certainly can play a significant role in environmental analysis (particularly within a public review process), there are fundamental limits to such use.

NOTE: Further comments related to "Map Addendum" are discussed in the relevant section of this report.

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CH2M
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engineers
planners
economists
scientists

31 January 1979

S10693.E0

Mr. Bill Fitch
Executive Secretary
Energy Facility Site Evaluation Council
820 East Fifth Avenue
Olympia, Washington 98504

Dear Mr. Fitch:

Subject: Preliminary Draft EIS for NTPC Project

Attached is one of ten copies of the draft EIS in an unproofed and unedited form. We have serious reservations regarding the value of this document because we feel it has major problems. It is our recommendation that this draft not be circulated to the public. In our opinion it does not comply with SEPA guidelines for draft environmental impact statements and it would not be in the state's best interest to release a DEIS with such serious flaws. The major inadequacies in the application (and subsequently in the DEIS) are:

- The need for the project was not demonstrated adequately.
- Alternatives to the project were not considered comprehensively or thoroughly.

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- Alternative off-loading sites and pipeline corridors have not been analyzed in a manner which would permit comparison with the proposed project.
- The NTPC application inadequately describes existing conditions, environmental impacts, and mitigating measures (as we had also earlier noted in our application compliance report, 3 January 1979).

Furthermore, it has become clear to us that the assumption that the NTPC application would suffice as the sole source document for a draft EIS is not valid. The following considerations have brought us to this conclusion:

- The NTPC application is incomplete.
- Other relevant reports including the BLM draft environmental impact statement, NOAA's recent study, the Washington Association of Counties study, and the Department of Energy's study provide necessary data for an acceptable DEIS and should be incorporated.
- More time should be given to consideration of the intervenors' comments to allow a better treatment of mitigation measures.

### Need for Project Not Demonstrated

NTPC has no contracts with refineries in the Northern Tier states to accept crude oil and recently the State of Minnesota announced that they saw no need for the project. Project need was unsatisfactorily described in two paragraphs of the application. The DOE report may more adequately address this question and should be analyzed and incorporated into the DEIS.

In our opinion the State of Washington should not have to decide on the merits of this project until the need for it has been established.

### Alternatives to the Project Not Described

There are two primary objectives of the project:

- To relieve surplus ANS crude on the west coast.
- To supply projected shortfalls in the Northern Tier states.

There are many alternatives to meet these objectives; many of them include separate solutions to each problem (e.g., trading ANS crude to Japan for Middle East oil). These alternatives were not developed sufficiently to judge their merits. SEPA regulations (WAC 463-46-490) are explicit in requiring alternatives evaluation. Compliance with this guideline is therefore not possible.

### Description of Existing Conditions, Impacts Inadequate

The regulation, WAC 463-46-405, particularly Section 2, emphasizes that a fundamental purpose of a draft EIS is to bring to attention "any issue of potential environmental concern which should be explored." Attachment 1 is a list of areas in which the data base is insufficient to assess impacts.

### Alternative Off-Loading Sites and Pipe Corridors Not Detailed

Alternative tank farm sites and pipeline corridors at this time are not subject to comparison. For example, risk analysis of spills was not performed quantitatively for competing off-loading sites and it is not possible to say whether an alternative is safer than the proposed project. The 2-mile-wide corridor presents too many variables to allow a realistic assessment of impact or mitigation measures.

### Conclusion

Grappling with these issues has made our job in producing the DEIS difficult and our efforts in that direction have been halting. Because our sole resource document, the NTPC application, is not complete, we have not been able to produce an acceptable DEIS--one that could serve as a decision-making document for the state.

We will continue working to refine the draft. However, I suggest that we meet at your earliest convenience to discuss directions for proceeding with the project.

Sincerely,

Jerald D. Hansen

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## MAP ADDENDUM

These maps were taken from the Department of Natural Resources (DNR) Washington Marine Atlas, Volume 2 (South Inland Waters) and Volume 3 (North Coastal Waters). The DNR Atlas was released to the public in July 1974.

What was not included in the BLM DES are the following quotes from the Atlas on page 11 of Volume 3 and page 11 of Volume 2:

(DNR: Pg.11, 3 para.) "Information which has already been included in other easy to obtain publications has been omitted as well as information not directly related to marine resources, or their utilization."

(DNR: Pg.11, 5 para.) "The Washington Marine Atlas is an aquatic land management tool. As such, its utility and limitations should be fully understood by users in order that maximum benefit can be derived from the information included. Since existing information was collected, the Atlas suffers from inaccuracies contained in the original surveys. In most cases, the data were not field verified by the Atlas staff. Because of the scale used in portraying the inventory items the degree of accuracy is limited. For more accurate data, refer to the original source or when necessary a field check may be desirable." (Emphasis added)

(DNR: Pg.11, last para.) "Caution: Because of the small scale of the map base and of the original information upon which the Atlas is based, care must be exercised in accurately locating the boundaries of resources listed."

It is felt that the Map Addendum of the Draft Environmental Statement is more than just an addendum. It is concise and attempts to inventory existing human and natural resources. It graphically summarizes the entire Statement, including human and natural impacts. Because it is easily read and

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summarizes a mass of written data, it is felt that the Map Addendum will be used as a major decision-making evaluation tool. It may possibly be the most important portion of this DES.

However, while the Map Addendum is comprised of attractive graphic presentations, it substantially fails to adequately illustrate specific site information and detail specific resources and impacts. Perhaps, individually, errors can be explained. Collectively, substantial inadequacy cannot be explained.

Following are examples of the kinds of errors, omissions and deficiencies characterizing this document:

**Page 3:** Forks is listed but Port Angeles, the site location of the terminal facilities and the major impacted area, is omitted from the map.

**Page 5:** An epicenter, Zone 2, is not indicated at Port Angeles as shown by the Bulletin of the Seismological Society of America. A smaller epicenter near Pysht is also omitted. Another Zone 2 on Vancouver Island, directly across the Strait of Juan de Fuca, is omitted. In 1869, Port Townsend had an earthquake listed as severe. A 1904 quake, 48.5N/123.3W was felt for 20,000 sq. miles.

**Page 7:** Faults on the Olympic Peninsula are not adequately defined. A seismic trend map would show a line near Port Angeles along the Strait and across the Puget Sound. There are 14 listed events: 1952-57 and 1967-68. This Port Angeles—Seattle fault is considered well-defined. Another line of events is farther east, from Vancouver Island to Port Townsend to Everett. This has resulted in 16 events: 1856-72, 1950-64. This is also considered a well-defined fault line. Is the Calawah fault indicated?

**Page 11:** This is an ecoregion map but the unique ecosystem of the Olympic Rain Shadow is not listed. Nor is the Rain Forest. The Rain Forest is also left out as a separate ecosystem. There are only two Rain Forests in the U.S.A.

**Page 15:** Olympic National Park (ONP) is shown incorrectly. The Bogachiel, Point of Arches area and Heart O'the Hills parkway corridor are not shown. Dungeness National Wildlife Refuge is omitted. Indian lands are also omitted.

**Page 17:** No rail transportation is indicated in Port Angeles. Once again, Port Angeles is not shown on the map. It would appear that Forks is the major metropolitan area on the Peninsula.

**Page 26:** Port Angeles is a class "A", yet it is omitted from the map. Discovery Bay is a class "AA" and is also omitted from the map. Canada is ignored. Why aren't the many rivers west of Port Angeles listed? They are significant spawning rivers, some of which support hatcheries, and could be directly impacted by a tanker accident in the Strait.

**Page 28:** The map does not show eel grass bed in Sequim Bay (Jamestown area), large kelp beds off of Jamestown, salt marsh at Grays Marsh and Washington Harbor or extensive salt marsh at Salt Creek or at the mouth of the Pysht.

Kelp beds run nearly unbroken from Angeles Point westward to Low Point. The only bare spots are a small piece at Freshwater Bay, one in Crescent Bay and one at the mouth of Whiskey Creek. Additionally, Freshwater and Crescent Bays contain eel grass beds than have been omitted from this survey. Similarly, major kelp beds are found off Green Point.

Again, no resources are listed for Vancouver Island.

**Page 30:** Ediz Hook is camouflaged by the color overlay. The Hook was originally formed and renewed by sedimentation drift nearly identical to that of Dungeness Spit. The gravel characteristic is questioned. Dungeness is characterized as sandy.

No resources are listed for Vancouver Island.

**Page 32:** The oyster farm in Sequim Bay is not on the map. On page 4 of the DNR Atlas (4 para.) is: "It is important that one does not try to locate oyster beds for sports harvest from these maps. Only commercial oyster beds are shown; with the exception of Hood Canal which is a very important oyster area." (Note: Emphasis not added)

**Page 34:** While the DNR Atlas shows butterclams and littleneck clams from inside Port Angeles Harbor to east of McDonnell Creek; BLM omits them.

This map shows a large potential geoduck industry east of Port Angeles which would likely be impact by the proposed project. The geoduck industry is currently being stimulated on Vancouver Island. The proposal could have a major impact on this new, potentially lucrative industry, yet it is not even indicated on this map.

Almost all the beach area west of Port Angeles that is composed of rocks and gravel support populations of hardshell clams. Areas such as Twin, Deep Creek, Pillar Point, and the Majestic area provide sport harvest of clams in the winter months. Other areas such as Codfish Bay and the beach east of Twin contain clams.

**Page 36:** Shrimp are in abundance in the Port Angeles Harbor yet are omitted from this map. (Note on page 68 of the Map Addendum that spills would harm the shrimp and crab in the Port Angeles Harbor.) Over 2,000 permits for shrimping within the Harbor were issued last year. Many do not secure permits.

Port Angeles Harbor has been one of the better shrimp grounds, both for sports and commercial harvest, since the mills initiated pollution abatement efforts in the 1960's. In 1978, virtually all of Puget Sound was closed to shrimp fishing, yet the Port Angeles Harbor remained open.

There are enough scallops west of Port Angeles in all rocky, cliff areas to attract good amounts of sports divers. Favored areas include Freshwater Bay, Agate Bay, Tongue Point, Pillar Point, Coal Mine area, Slip Point and many others.

While the DNR Atlas shows crabs in the Port Angeles Harbor, BLM does not. Why not? Neither document indicate crabs in Sequim Bay yet they are there. Dungeness crabs, due to their migratory nature in the Strait of Juan de Fuca, occur in all waters west of Jamestown to Neah Bay in sufficient numbers to attract good amounts of sports crabbers and a small commercial fishery. Port Angeles Harbor has supported good numbers of crabs for many years. Other favored places not shown are Twin, Deep Creek and Morse Creek.

These are grave omissions.

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Page 38: (DNR: Pg.6) "These maps do not show the distribution of fish but rather show the areas heavily utilized by fishermen. In effect, these data therefore reflect the areas where fish are concentrated." This is an assumption NOT a resource inventory. Is this the BLM's assumption also?

This map does not show the halibut area off Green Point. It also lumps steelhead, sea run cutthroat, surf perch and all bottom fish in "non-salmon." DNR distinguished between them.

Some species of groundfish can be caught during the spring through fall in all the Strait. There is a substantial groundfish trawl fishery in the Strait at Port Angeles and at Dungeness.

Smelt spawn in Dungeness Bay as well as other places in the Strait. Smelt have been observed on a fairly regular basis at Pillar Point, Codfish Bay. In addition, they have been observed occasionally in good numbers at the mouth of the Elwha. They are fished on a regular yearly basis west of the mouth of the Dungeness. At the present time, there is a good sport smelt fishery in the boat haven in Port Angeles Harbor.

Page 40: The DNR Atlas illustrates a noticeable more extensive area in the Strait and closer to the shore than the Addendum. DNR indicates commercial salmon fishing off Point Williams and extending quite close to Protection Island as well as all around the Island. The Addendum doesn't even show Protection Island. In fact, Protection Island does not appear on any marine resource map in this Addendum yet it is an areas specifically rich in marine resources. A sizeable area of the Island belongs to Nature Conservancy.

Port Angeles Harbor is once again hosting spawning herring since the successful pollution abatement effort by Crown Z, IIT Rayonier and the City of Port Angeles.

Candlefish (sand launce) are not mentioned at all as a fishery resource. They have little value as a commercial or sport fish, but are one of our most valuable forage fish for salmon and groundfish. They are very numerous in the Strait and spawn heavily on Ediz Hook, off Angeles Point and off Green Point.

Page 42: Dungeness Spit is listed as a waterfowl area. This is not adequate. It is a National Wildlife Preserve and must be so designated. This kind of misrepresentation lessens the perception of impact. Low Point, at the mouth of the Lyre River, is also a waterfowl area that is omitted.

Cormorants are found all along the Strait yet are not shown in the Addendum. Waterfowl are found all around Protection Island.

Page 44: Harbor seals are very common in the Strait. Dungeness Bay and Port Angeles Harbor are two of their favored gathering places. In recent years, up to 60 animals at a time have been observed in Port Angeles Harbor and up to 100 at a time in Dungeness Bay. They are also seen in smaller groups at Freshwater Bay, Majestic, Twin, Deep Creek, Pillar Point, Jim Creek, and other areas in the outer Strait. They can be found on Travis Spit (mouth of Sequim Bay) and on Protection Island.

It should also be noted that Low Point is a haul out place, not just fishing grounds for seals. The sparcity, as indicated on the map, should emphasize the importance of a haul out point.

Stellar sea lions are found year-round in the Strait. They are not as numerous as hair seals and move around more, but observations of one or more at a time are very common throughout the Strait. In recent years, when heavy concentrations of bait fish are in Port Angeles Harbor, as many as 9 sea lions have been observed wintering there at a time. As many as 40 animals have been observed recently on Race Rocks on the Canadian side. They seem to be more numerous on the Canadian side of the Strait because of less overfishing of groundfish, which is their main feed.

River otters are very common in the Strait. They have definite tendencies to move from the streams and to spend most of their time from April to October on salt water beaches and in the salt water. They are observed along the entire Strait, sometimes in rather large groups. A group of 26 otters on the rocks west of Twin has been observed. Port Angeles Harbor has had a resident population of river otters for many years that live in the Boat Haven. They are numerous enough that they have caused many boathouse owners to complain about them to the Game Department.

The killer whale (orca) migration path as noted in the Addendum is subject to challenge. They actually wander much more than indicated and are seen quite commonly within 1/2 mile of the beach along the Strait. They also enter Port Angeles Harbor on occasion. The pilot whale (blackfish) has been omitted from this list and they are at least as numerous as the orca. Porpoise have also been omitted and observation of at least two species are common off Ediz Hook and throughout the Strait.

As the grey whale grows in numbers through protection, more observations are being reported in the Strait from late winter to late summer. For several years, 5 to 10 a year have been observed in the Strait. For the past 5-years, at least 1-observation per year has been made deep inside Port Angeles Harbor. This is probably due to the great increase of bait fish in the Harbor in recent years.

Page 46: Battelle Northwest is a Scientific Research Site and is ommitted from the Map Addendum. It is one of the major marine research sites on the West Coast. This is just another example of the degree to which the DES , specifically the Map Addendum, understates existing resources and, consequently, inevitable impacts.

Page 48: The Olympic National Park has been altogether omitted from the map. The coastal sections of ONP have not been identified as public parks. These coastal areas are very important public areas, receiving more than a third of the backcountry visitors in ONP every year. There were over 2 1/2 million visitations in 1978.

Sequim Bay has two public tideland areas, not one. The beach at Clallam Bay is not listed as public.

The DES does not speak to the direct impact and potential loss of the public tidelands identified on Ediz Hook.

Page 50: There are not 3 boat marinas in Port Angeles Harbor and none on the outside of the spit (Ediz Hook). There are not two boat marinas in Sequim Bay. There

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are not two at Dungeness Spit. The designation of boat marinas in Clallam County are inaccurate.

Page 54: This map of shoreline slope stability is useless unless the project location is identified. If this is done, it would be evident that the pipeline cut in the bluff at Green Point occurs at one of the few unstable slopes shown. Omitting the site specific location of the storage facilities is irresponsbile. The map also omits the area immediately to the east, including Dungeness Spit. Consequently, the danger to the Spit by any alteration of the existing natural condition of the slopes at Green Point is not observable.

Ediz Hook is modified by riprap from the eastside of Crown Z, extending east and onto the Coast Guard base. The map shows two areas of "stable slope" within the rock riprapped areas. This designation of "stable slope" is questioned.

Page 56: The map illustrating existing uses in the Port Angeles Harbor demonstrates gross omission. Omitted are the Port of Port Angeles, the M&R Timber Co. docks, the largest boat marina in Clallam County, Foss Tug, one of the log dumps, the U.S. Cambell dock, the City's largest motel and restaurant, a city park, public boat launches, a commercial fish buying dock, the Coast Guard Station other than the berth, and residential uses. Is this "oversight?"

Page 59: The depiction of the berths is misrepresentative. The 3-berths will actually cover a considerably more extensive area than shown. Additionally, the booms to be used around the tankers at berth must be depicted as they will directly contribute to increased Harbor conjestion and consume an even greater surface area in the Harbor.

Page 59: Park Headquarters for the Olympic National Park is incorrect. No reference is listed for the Visitor Center, which is separate from Park Headquarters. The Visitor Center is a prime park attraction in the Port Angeles area. Visitor Center 1978 visitation was 174,386. In addition, the two shades of grey are not explained.

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Pages 59-61: These maps are inaccurate and deceptive. The maximum 1-hour, 24-hour average $SO_2$ concentrations isopleths are entirely unnatural. Straight-edged N-S isopleths are not natural. An example of the deception inherent in this approach is the 24-hour average (maximum) of four possible models for estimations: historic, valley, window or tem. The ES Team chose the lowest value. This model did not use terrain modeling and disregarded inversion heights. For 2-berths, the listed estimate is low by a factor of 14 compared to the maximum prediction. For 3-berths, it is low by a factor of 16.5. BLM ignored their own consultants. Furthermore, technical evaluation reveals these higher estimations to be too low.

The annual estimation is even more absurd. How can a project that will emit nearly as much as the major existing emitter, with its annual emmissions added to and compounding the existing annual emissions, result in less than 60% of historically found annual $SO_2$ levels? In no year since 1974 has the annual $SO_2$ level been as low as indicated it will be after adding another major $SO_2$ emitter, i.e. the proposed NTPC project.

Pages 65- : The alignment maps are misleading in not actually showing total impact. One eagle nest disturbed is a notable impact, but 10-20 areas along the pipeline route is an unacceptable impact. The risk to the second largest osprey nesting grounds in the Western U.S. is unacceptable. The maps are deficient in showing only a representative number of eagle nesting grounds. Personal experience verifies the fact that the Plains of Montana have eagle populations. Additionally, it is unbelievable that only one black-footed ferret habitat would be impacted in crossing the Plains. Any prairie dog village is a potential habitat. Not enough emphasis is given to the importance of strutting and dancing grounds of the sage hen and grouse. Social impacts to Port Angeles is outrageously underrated. Why do the maps show no potential impacts west of Port Angeles?

Page 68: Olympic National Park is not shown.

Page 136: The key to land uses omits any reference to the Olympic National Park and its proximity to Port Angeles.

Why the big, white void on page 137? Why no mention of impact on visitation to the ONP? One of the largest National Parks in the nation with 2 1/2 million visitors annually deserves recognition. ONP visual and recreational resources should be noted.

General: The terminal facility and storage facility locations should be identified in some consistent manner, such as a red overlay, on all maps in order to graphically relate resources to impact area. No assessment of impacts can be possibly made without relating resources to the site-specific facility locations, rendering this document totally useless as a decision-making tool.

The following pages of maps do not identify any Canadian resources:

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|---|---|
| Oyster & Natural Areas | 32 |
| Geoducks & Clams | 34 |
| Shrimp, Crabs & Scallops | 36 |
| Sport Fishing | 38 |
| Commercial Fishing | 40 |
| Waterfowl Areas | 42 |
| Public Parks | 48 |
| Boating | 50 |

This information has been available from the Environmental Protection Service, Canada since July 1978 in a series of marine resource maps including: Shellfish, Groundfish & Herring Resources, Commercial Salmon Fisheries, Sport Fisheries, Marine Mammal, Marine Associated Birds, Shoreline Geomorphology & Marine Vegetation, Ocean Currents, Winds, Ecological Reserves, Parks, etc.

Omitting available information not only further contributes to the deficiency of the DES but effectively obviates public review & public comment on this very important part of the DES. It does not enhance public confidence in either the document or the process.

Sea urchins have been omitted entirely from the marine resources maps. They occur in great numbers throughout the Strait and Puget Sound in rocky areas. There is a notable and growing commercial fishery for these sea creatures. Their roe is sold and the shells are dried and made into various types of ornamentals and curios.

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The Map Addendum should include known terrestial animal ranges, migration routes and other special use areas such as calving grounds and wintering areas.

This DES has been marked by omissions, deficiencies and errors. It has been the prevailing judgment of the reviewers that the DES has erred to the benefit of the project applicant. This impression of bias was particularly evident in the Map Addendum. One reviewer submitted the following in summary to his analysis of the Map Addendum:

(Clean Air Act as amended August 1977; Section 113 (C)(2) "Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under this Act or who falsifies tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Act, shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than six months, or by both."

Addendum: (Page 38) The Marine Resources Map delineates an extensive sports fishing and commercial fishing area for salmon and bottom fish. The map is so general it fails to define any critical habitat areas for some of the important species. A specific case-in-point is the entire stretch of water from Ediz Hook to just east of Green Point which is defined as a critical habitat area for Pacific Halibut (DOE-Baseline Study November 1977). It is interesting to note that BLM made reference to the DOE-Baseline Study, but failed to mention the critical habitats. Also interesting is the table on page 2-23 which lists, in a textbook fashion, a list of marine organisms and their preferred habitat with one exception -- Pacific Halibut.

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## MITIGATION MEASURES

In review of a draft environmental statement it is customary to include clear statements illustrating how adverse impacts previously discussed in the document will be mitigated. To discuss, let alone to formulate, mitigating measures requires that one have a fairly clear understanding of the project and the foreseeable impacts which would accompany it. The generation and analysis of mitigation measures by Task Force members has been difficult because of the shortcomings of the DES; a lack of consistent, specific information provided by the Applicant to area local governments and the public; sporadic modification of various aspects of the project, including pipeline location, throughout the public review process; several of the adverse impacts being understated; and, a general lack of knowledge regarding aspects of petroleum industry development in the community.

The attached measures are suggested to local governments for consideration during the permit process. If the mitigation measures are to be a meaningful part in the consideration of the project the measures should be designed to be carried out as early as feasible during the planning and implementation of the proposed action.

### AIR

Tankers and related marine craft will be equipped to burn 0.5 percent or less sulfur content bunker fuel for offloading crude oil in Port Angeles, and for a distance of 20 miles upon departing the port.

Appropriate noise suppression devices for pumps, vehicles, and construction equipment will be installed. All Federal and local noise standards and regulations will be followed.

The applicant shall be required to trade off, on a ratio to be established by local government, in cooperation with pre-existing industry, the emissions expected from the project in the Port Angeles/Clallam County area. The trade-offs and the exact level of emission credits shall be approved by local governments prior to issuance of any permits.

Trained inspectors from state and local air quality agencies will perform complete monitoring, from the ship's entering to its departure. This will include all off-loading of crude oil, refueling, and ballasting operations. The inspector must be present during off-loading, but may be assisted by automated electronics to cover all other activities related to safety, air pollution, and water pollution. The inspector will be required to record any unusual procedure or accident, especially if it involves a danger of fire, oil spill, or unusual air pollution. Specifically, the inspector will not allow the discharge of oil until the inert gas system is operating properly on tankers so equipped. All records will be considered public documents.

An air pollution monitoring station will be established in the port area to aid in measuring ambient concentrations of air pollutants from the port and general area.

A temporary barrier or other measures will be utilized to reduce as much as possible the noise levels north of piledriver operation at Pier J.

Homeowners and landowners located in the tank farm air pollution affectation area should be compensated by NTPC for the devaluation of their property due to the presence of the air pollution.

Build a return line from the tank farm to the terminal to return polluted water from the tank farm to the tankers to be utilized as ballast (Item #10, S.A.I. technical documents.)

Provide portable booms to place air monitoring instruments in tanker stacks.

Prohibit purging of tanks in the Straits of Juan de Fuca.

Require uniform Coast Guard personnel to monitor all tanker hook-ups and disconnections.

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Consider requiring construction of a bonnet over berths to collect and treat all air pollutants emitted by tankers.

Prohibit the off-loading of petroleum during periods of critical meteorological conditions.

Require latest state-of-the-art vapor recovery systems on the storage tanks. (Check with Portland, Me. and other sites for experience).

Negotiate a new filtering system for the Olympic Memorial Hospital if Hosp. Dist. Board of Directors desires such. Increased air quality problems will only intensify present problems. Other centers of aged persons with respitory ailments may desire protection also.

Require reimbursement to local mills of a portion of their costs over recent years (and share of future costs) for pollution abatement (air and water). Certainly if air or water quality standards are lessened or waived for the proposed facility, local mills should be reimbursed some of their costs in attempting to meet those standards. Also, the proposal proponents might be required to provide funds to local industry if the project pollution levels raise the degradation levels to a point where local industry is precluded from expansion.

Consider requiring scrubbers to be attached to ships(or a hood as in a lab) for collection of ship emissions when in port.

Prohibit venting and purging with violations enforced with fines and possible restriction against further entry into port.

Prohibit no more than 20% ballasting(If more is required because of high seas, the ship must delay deberthing).

Consider restricting ballasting to daylight hours only with penalty for violation including possible restriction against subsequent re-entry into port.

Require baffle houses to be constructed around all pumping stations.

Establish a monitoring system to check fuel consumption by the tanker fleet.(enforce low sulfur fuel requirement).

Applicant shall submit for approval a noise pollution monitoring system.

If, as a result of the oilport being sited in Port Angeles, air quality problems are even close to health hazard levels the applicant should be required to relocate the residents of such affected areas.

## ARCHAEOLOGICAL/HISTORICAL

A penalty should be predetermined for delay in reporting any archeological/historical find.

Cultural resource surveys will be conducted prior to construction of the terminal, tank farm, pipeline, pump stations or any other ground-disturbing activities related to the project implementation.

The Bureau of Land Management must recognize its legal obligation to ensure that all Bureau projects and Bureau-assisted or licensed projects: (1) give adequate consideration to cultural resources, and (2) do not inadvertently harm or destroy cultural resources.

The primary authorities for the protection and mitigation of sites or areas which may be impacted are: (1) the 1906 Antiquities Act, (2) the 1966 National Historic Preservations Act, (3) the 1969 National Environmental Policy Act, (4) Executive Order 11593, (5) the 1974 Archeological and Historic Preservation Act, and (6) 36 CFR 800.

It shall be the position of the Bureau of Land Management that if any portion of the NTPC project is approved a cultural resources plan shall be performed prior to construction and full compliance with guidelines developed pursuant to the above laws will be necessary.

The first step required is the identification of all sites or properties currently on or nominated to the National Register of Historic Places. This step has been completed and such properties are referenced in Chapter 2, Section 2.1.9.3.

In compliance with 36 Code of Federal Regulations (CFP)800, and prior to any permit issuance, the applicant will concurrently conduct cultural resource overviews and an intensive (complete) survey of the proposed right-of-way and any supporting facilities where surface disturbance would occur (including, but not limited to, power-line extensions, pump stations, roads, and borrow areas).

In addition, a sample survey (10 percent level) will be conducted for a buffer of one-quarter mile on each side of the proposed right-of-way.

An archeólogist must also inspect the pipeline trench for subsurface archaeological sites concurrently with the trenching operation.

Archaeologists, historians, or paleontologists hired by the applicant for project work must be approved by the Bureau of Land Management and their work must be completed under an Antiquities Permit.

All cultural resources located along the proposed route will be evaluated by both the Bureau of Land Management and the appropriate State Historic Preservation Officer for National Register of Historic Places eligibility-Coordination must be maintained throughout the project between the Bureau of Land Management, the applicant, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation, pursuant to 36 CFR 800.

The results of the field inventory will be submitted to the Bureau of Land Management, the State of Washington, Clallam County and Port Angeles in acceptable report form. The report will detail findings of the inventory and make recommendations for further resource protection, either by avoidance or through mitigation studies. All sites will be evaluated for possible inclusion in the National Register of Historic Places.

CONT

Mitigation work may include all levels of research and field data collection, including surveying, photographing, collecting, recording, excavating, subsequent data analysis, and publication.

Upon completion of the survey and evaluation of all cultural resources, three options are available for legislative compliance (in consultation with the State Historic Preservation Officer, the Advisory Council, and the Bureau of Land Management): (1) avoid the identified resource; (2) mitigate impacts to the resource through a rigorous, comprehensive scientific study; or (3) a combination of the first two where feasible. Whenever possible, cultural resources will be avoided

The Bureau of Land Management, State Historic Preservation Officer, Advisory Council, and local planning commission and historical associations and boards must be afforded an opportunity to comment on and approve the protection plan for sites and facilities within the limits of the project.

All identifiable historic roads and trails with visible remains of the road or trail should be crossed with a minimum area of disturbance, or should be avoided. This may require passing the pipeline underneath the road or trail without disturbing the surface on either side of the historic road or trail. In certain situations it may be deemed feasible to pass the pipeline beneath a cultural resource where avoidance or prudent scientific study appear unfeasible.

If the decision is to avoid resources, and site locations are known, the corridor center line, tower sites, access roads, pump stations, etc., must be relocated. Relocation of proposed facilities may also be deemed necessary to prevent indirect impact to sites located near the corridor. This would protect against needless loss of nonrenewable resources as required by Federal legislation.

If mitigation is selected through scientific study, two categories may be considered: (1) that which must be accomplished prior to granting approval for pipeline construction, and (2) that which must be done in situations where the applicant may uncover subsurface cultural resources during development work.

The following detailed measures are designed to mitigate impacts upon cultural resources from the construction of the project. All specifications reflect reauirements of existing Federal and state mandates and are required measures for all affected land, regardless of ownership.

1. Prior to construction on any part of the proposed right-of-way or related facilities where adverse impact to identified cultural resources is unavoidable, a full and complete mitigation effort must be implemented. The results of the mitigation work shall be reported to the Bureau of Land Management, the State Historic Preservation Officer, and the Advisory Council on Historic preservation, and relevant local governments.

2. The applicant will immediately bring to the attention of the BLM archaeologist all antiquities or other values of cultural or scientific interest discovered after completion of the inventory. Such discoveries will be left intact until clearance to proceed is granted by a BLM project archaeologist.

3. To facilitate better coordination of cultural resources mitigation during the construction phase, the applicant will (1) provide a project archaeologist to do on-the-ground monitoring of construction, (2) flag the perimeters of archaeological sites that are to be avoided, (3) promptly report pot hunters or vandals to the liaison officer and project archaeologist, (4) require operators of vehicles or other equipment to operate only in specified areas which have been cleared for cultural resource valves, and (5) inform all construction staff of their responsibilities from the standpoint of legal requirements for preserving cultural sites and artifacts.

## EASTERN CLALLAM COUNTY

Several mitigating measures related to eastern Clallam County are contained in other sections of this report.

Dust control, extra-heavy equipment use of county roads, the lack of rockless dirt in Clallam County for fill around the pipeline, the lack of protection for farm animals, and quality control for the county during construction are concerns of eastern Clallam County residents during the pipeline construction period. These and other concerns of residents along the route of the pipeline in Clallam County must be mitigated by BLM.

Land leveling could expose the pipeline if it is buried at normal depth (36 inches) and developers and farmers may have to bear the expense of lowering or moving the pipeline if it interferes with development or farming operations. Pipe should be laid anticipating future leveling of areas for development, farming, etc.

## EMERGENCY SERVICES

Developer should be required to submit to the local governments an emergency evacuation plan to be implemented in the event of a disaster related to the oilport. A large fire and/or explosion would be obvious potential events which may cause implimentation of such a plan. A large spill may result in massive hydrocarbon levels resulting in a need for evacuation.

The County should be reimbursed for any expenses incurred as a result of one County Emergency Services Director or staff assisting in the development of the evacuation contingency plan.

## ENGINEERING

Any saltwater ballast, contaminated with oil, offloaded in the port will be pumped to water treatment facilities constructed and operated by NTPC where the oil will be separated and sent to crude oil tanks. The remaining water will be treated to produce an effluent that will comply with EPA standards.

Tank cleaning sediments will be diverted to holding tanks to facilities constructed and operated by NTPC. A monitoring program will be presented to local governments for approval prior to any permits being granted.

CONT

Tankers utilizing the NTPC facility will burn 0.5 percent or less sulfur content bunker fuel for off-loading crude oil and while in port

Purging will not take place within the port or within a certain distance to be established by area local governments. A program of monitoring violations of this policy shall be submitted by NTPC and approved by local governments prior to the issuance of any permits.

The pipe will be buried at a sufficient depth to prevent its being exposed by scouring action during infrequent flood flows in the Dungeness River and any other creek, channel, or watercourse traversed. Work undertaken in any creek, channel, or watercourse will not obstruct storm or floodwater flows, and adequate measures will be taken to preclude damages therefrom to any adjoining public or private properties.

Excavation of sand, gravel, and other materials within Clallam County related to the oilport project must have prior approval of the Board of Clallam County Commissioners. Plans for excavation, transportation and reclamation shall be presented well in advance of preferred use dates.

During and after construction of the pipeline adequate surface drainage should be proveded in areas of steep sidehill cuts and fills.

In some circumstances it may be appropriate to alter the means of crossing a stream from an underground crossing to a protected bridged crossing on streams with steep gradients. The applicant may be required to utilise this construction technique in appropriate locations of pipeline construction.

Protection of streamside vegetation will be provided during sand and gravel excavations.

Surplus excavated materials within the right-of-way will be placed at predetermined and approved disposal areas to reduce visual impacts. Such areas will be designated by the game range manager.

After all lines are covered and soil compacted, any visible berm will be spread to contour to reduce visual impacts and to allow for natural revegetation.

The use of explosives may be limited to the certain period, as determined by the Board of Clallam County Commissioners and the Port Angeles City Council regarding use of explosives in areas within the local governments proper jurisdiction.

All construction activity will be kept within right-of-way limits except for the moving of equipment into and out of certain areas. This movement will be along established roadways. There will be no construction camps unless approved by local governments and the only materials stored on the right-of-way will be pipe strung along the ditch line.

The pipeline right-of-way will not be bladed in its entirety, but only within that portion required for construction.

Pipeline crossings of ditches and washes will be buried below the flow line or protected by concrete deflection structures to prevent erosion.

## FIRE PROTECTION

Construction through fire-hazardous areas will be scheduled, where possible, during the periods of low-fire hazard. Fire safety precautions will be strictly enforced.

A fire and explosion contingency plan must be submitted to and approved by appropriate local governments prior to the issuance of any permits related to this proposal.

## FISHERIES

Water crossings will be made at periods of low flow or no flow.

Any salmon streams from which stock is depleted as a result of the adverse effects of an oil spill will be restocked. Restocking will not begin until it has been determined that the adverse effects of the oil spill have subsided.

Public access to shoreline fishing areas in the vicinity of the oilport terminal facility will not be curtailed. This can be accomplished by ensuring that free public parking adequate for approximately 50 cars is provided and that the shoreline is not fenced off from public access. Public access to the trestle can be denied for safety and security reasons. Other safeguards may be arranged by local governments and oilport operators.

An analysis of dredging techniques will be conducted and a technique should be prescribed which would minimize environmental impact.

Dredging operations shall be conducted during the time of year that will minimize the impact on the marine biota.

There is no discussion of loss of biological environment to slides. When slides block a stream or creates extensive sedimentation in a stream impacts will be significant. Mitigation measures will have to be established to replace possible fish and wildlife losses from slides that block migratory routes or cause extensive sedimentation.

Screening should be required of test water withdrawal systems, ballast water intakes on ships, and any other water withdrawal structure throughout the system.

Pre-blasting activities should be planned to reduce impacts to fishery resources.

Require the developer to submit a plan for approval of local government which would address steps to be taken to assure reasonable protections for, and development of, boat marinas.

Develop contingency plans to cover possible damage to fishery resources in event of oil spills from any source:

- Develop additional baseline studies and inventories of existing marine resources, including projected growth without the proposal being constructed.
- Develop oil spill contingency clean-up plans to mitigate damages.

CONT

- Develop monitoring program of marine resouces and water quality.
- Develop resource recovery funding mechanism to be implemented in the event of deterioration of marine resources (whether caused by small amounts of petroleum introduced into the marine environment through normal operations or large amounts of petroleum introduced as a result of large spills).

The developer of the proposed project should submit plans to meet requirements in the above-listed areas as desired by local governments in cooperation with appropriate State and Federal agencies.

Information necessary to evaluate the environment to be affected and determine anticipated impacts should include a description of all streams with significant fish or wildlife resources, not just those classified by the USGS. Within this description the following should be included:

a. distance of the crossing from the mouth of the stream;

b. gradient in degrees of slope of the embankments on both sides of the streams;

c. vegetation within the floodplains of the stream crossings;

d. identified shallow water aquifers at all crossings;

e. a description of crossing techniques, dredging, handling of spoils and timing for each stream.

## FOREST INDUSTRY

An adequate fund should be created which would compensate land owners for any future direct or indirect oil port related damage. For example, fire or explosion damage, oil spills from tankers, tank farm, or pipeline, which would damage marine or terrestrial resources; wind damaged timber resulting from the right-of-way clearing, etc.

Note: Other mitigating measures affecting the forest products industry and forestowners are contained in other sections of this report.

## GEOLOGY

Detailed geotechnical investigations will be conducted in the vicinity of faults (active and/or suspected), and the results of such investigations provided to local governments prior to the issuance of any permits.

In the areas of geologic or soil hazards (as defined by pre-permit engineering and geological studies) special design methods will be employed by NTPC.

Areas of potential landslides will be avoided or special precautions will be taken to help prevent pipe failure should a landslide occur.

Local Soil Conservation Service districts that include areas of new construction should be contacted to assist in design of erosion and sedimentation control measures prior to construction of the pipeline.

Where possible, bedrock excavation will be ripped with heavy equipment. When blasting is required, charges will be designed to confine the excavated material within the right-of-way.

Blasted rock, if appropriate in size and composition, will be used as trench backfill, as aggregate, or as erosion control material.

Geological investigations should be provided to county officials by the applicant to ensure that the pipeline alignment is not situated on landslide material or threatened by potential landslides.

Sec. 4.4; Page 4-2,4.4.
The map addeneum identifies the face of Green Point Bluff as highly erodible. This is also a recognized necessity for the perpetuation of Dungeness Spit

The applicant should fund a study by the U.S.G.S. to evaluate the contribution sediment drift between Ediz Hook and Dungeness Spit has on the maintenance of the spit and what impacts the proposed action would have on this action before we will approve the necessary permits for any of the pipeline.

Require the developer to submit a plan for local government approval covering the continual monitoring of the Dungeness Spit (and possibly several bluff areas). A contingency plan and funding may be required to mitigate adverse impacts caused to these resources as a result of the construction of the project and related development.

## HARBOR MANAGEMENT

Relocation plans for log storage areas, boat launches; Thunderbird Boathouse facility (including recreational moorages) pilot house, public beaches, etc., must be provided to and approved by landowners, leaseholders and local governments prior to the issuance of any permits.

Restrict the number of tankers within a specific distance of the port at anytime. Coordinate through port authority by radio communications.

Develop the funding of a new port facility with improved radio communication regarding vessel traffic control, vessel traffic monitoring, oil spill contingency capabilities, etc.

Encourage the U. S. Coast Guard to conduct extensive safety checks on all vessels prior to entry into port. Violations correction plan should be developed. Corrections should be made prior to entry whenever possible. Enforce penalties for violation of rules of the port including restriction on subsequent re-entry.

Require a permanent berthing of sufficient oil spill clean-up equipment and personnel in P. A. harbor. (LEss emphasis on Puget Sound if vessel concentration in P. A. area).

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**CONT**

Designate sufficient areas in harbor to assure adequate logloading facilities for those ships which load logs from the water.

Require proof of adequate liability insurance by tankers prior to entry into port.

Require developer to fund harbor beautification projects to offset (?) impact of proposed facility.

Require developer to submit plans to local governments to adequately control traffic and pedestrian access near the harbor and particularly on Ediz Hook during the construction and operation of the oilport.

LAND USE

A plan shall be submitted to and approved by local governments and landowners covering restoration of the right-of-way areas prior to the granting of any permits.

Temporary-use access roads will be removed and the area restored to the condition desired by the landowner.

Where required by the land owner, double trenching in cultivated areas will be practiced.

Upon approval of local governments, existing roads will be utilized whenever possible, particularly in agricultural areas.

Use of the rights-of-way will be made available if requested by local governments for trails and other recreational activities.

The specific sites of facilities shall be selected, whenever feasible, in a manner which avoids areas regarded as environmentally sensitive, and aboveground facilities shall be as aesthetically pleasing as possible.

Facilities landscaping plans shall be submitted to and approved by local governments prior to the issuance of any permits.

All valve locations in Clallam County will be screened with landscape planting and fencing to minimize visual impact on open-space values.

Streamside vegetation will be restored immediatily after construction to prevent bank erosion. Indigenous riparian plant species will be used.

Alternative pipeline routes may be approved with the concurrence of local governments.

Straight-line slopes in excess of a percent grade and sustained length to be determined by local government will be water-barred.

All soil sites compacted by construction equipment and not required for subsequent surveillance or maintenance operations will be ripped to restore the soil to the approximate original bulk density.

Prior to construction in any area where revegetation will be necessary, the applicant will contact the local agricultural and conservation officials to obtain information on the best plant species and revegetation techniques to be used for that area.

All remnants from construction will be removed and dumped at sites which have been approved by proper local governments. Remnants include wood, metal scraps, containers, concrete truck cleanouts, gravel and sand piles, pieces of construction equipment, and small fluid (oil)spills.

This section should specify techniques to detect sub-threshold leaks almost immediately. Also, the environmental impact section should include more information on the land use impact of sub-threshold leaks, especially in environmentally sensitive areas such as rivers and creeks. How long can such leaks go undetected? What is the potential for extensive sub-threshold leaks over a 10 year period?

This section should address landscaping of the tank farm facility. A landscaping plan should be submitted to appropriate local governments for review and approval. The landscaping plan should give precise information regarding the strip of trees buffering and screening the periphery of the tank farm The plan should be submitted prior to construction. The use of landscaped berms and painting of valves, buildings and fences with non-glossy paint which blends tanks and pump stations in with the surrounding environment shall be required.

The pipeline should be constructed during the dry months so that grass seed will grow sufficiently to prevent erosion of the corridor. Slopes should be terraced to reduce the velocity of storm water. The erosion control plan should e approved ty the County prior to construction.

Revegetation is obviously going to be difficult in some areas. What is going to be done to insure satisfactory long term reduction of erosion? Will it require that top soil, fertilizer and water be provided to any areas denuded more than a specified length of time? How will this be enforced? This would be especially important for areas bordering streams.

If the project is approved the approval should be subject to numerous requirements which mitigate adverse land use impacts, among such requirements:

1. Submission to County and City for review and approval of the following:
   a. Site design and overall layout.
   b. Landscaping and grading plans(including screening plans)
   c. Surface drainage plans.
   d. Exterior lighting plans
   e. Erosion control plans
   f. Vehicular movement plans.
   g. Water and sewage disposal plans
   h. Facility construction plans.
2. NTPC should provide the City and County, and other local governments, with sufficient funds to hire personnel to inspect on behalf of the City and County, and other local governments, the construction of the terminal, tank farm, and pipeline. These persons would assure that all conditions imposed by the state, county, cities and other governmental agencies are complied with

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Require the developer to submit plans for local government approval for landscaping procedures which will be implemented to mitigate effects of abandonment of the project. Applicant should be required to establish a fund which will adequately cover the cost of abandonment and reclamation.

LAW ENFORCEMENT

Comment: Developer should be required to submit a plan to local government for approval stipulating to certain actions which will be taken to alleviate law enforcement problems which may arise related to the construction or operation of the project. Ex.: Construction personnel found to violate local laws a certain predetermined number of times may be terminated or transferred. A pre-determined number of accidents at a single location may require that the developer fund additional traffic control devices or personnel at that location.

Additional personnel, equipment, training and in some cases facilities, shall be provided to local governments to assist in mitigating the law enforcement-related impacts of this proposal. See the "law enforcement" section of this report for a discussion which includes impact mitigation measures.

Developer should be required to submit a plan to local government for approval stipulating to certain actions which will be taken to alleviate law enforcement problems which may arise related to the construction or operation of the project. Ex.: construction personnel found to violate local laws a certain predetermined number of times may be terminated or transferred. A pre-determined number of accidents at a single location may require that the developer fund additional traffic control devices or personnel at that location.

Additional personnel, equipment, training and in some cases facilities, shall be provided to local governments to assist in mitigating the law enforcement-related impacts of this proposal. See the "Law Enforcement" section of this report for a discussion which includes impact mitigation measures.

MEDICAL

Consider relocation of the hospital and other medical facilities to locations where there would be more protection offered from damages in event of a tanker explosion.

If hospital is not relocated, fire and explosion proofing measures should be requested. Also, an improved air filtering system should be installed in the hospital, if desired by the Hospital District #2 Board of Commissioners.

OIL SPILL

The best state-of-the-art system will be used for detecting small subsurface oil leaks. A detection plan will be submitted to, and approved by local governments prior to the issuance of any permits.

The NTPC will prepare an oil spill contingency plan for the marine terminal at Port Angeles, the shoreline of Clallam County and the State of Washington, for the tank farm and for the pipeline route in Clallam County and Washington State. The contingency plan must be submitted to and approved by local governments, the State of Washington and the U. S. Environmental Protection Agency prior to the issuance of any permits. The plan will specify the sequence in which necessary actions must take place and by whom, and define the best technique for cleaning up a given spill, depending on location. Local governments, upon request, will be funded by the applicant to participate in the design of the plan.

Developer should be required to fund pre-spill planning with regular up-dating. BLM should develop a contingency plan for various situations involving spills of various sizes, locations, and material.

Support extension of the Vessel Traffic System to cover all petroleum-related tanker and barge traffic in the Straits and make compliance mandatory.

Require tank vessels engaged in the marine transportation of crude oil, refined petroleum products, or their by-products to be equipped with:

1. Loran C Navigational System receivers and other position-locating systems prescribed periodically by the U. S. Coast Guard.
2. Electronically controlled collision-avoidance systems where applicable to an appropriate vessel as prescribed by the U. S. Coast Guard.
3. Two radars, of types prescribed by the U. S. Coast Guard, in working order and operating.

Tankers exceeding a certain size limit to be established by local government, in cooperation with State and Federal agencies, lacking the following three maneuverability and stopping features must be escorted by tugs with an aggregate shaft horsepower equivalent to five percent of the deadweight tons of that tank vessel while navigating the Straits. Features are: lateral thrusters, controllable pitch propellers or astern horsepower equal to forty percent of rated horsepower, and redundant boilers, an auxiliary propulsion source or other backup equipment that the U. S. Coast Guard or the State of Washington may require by regulation to provide for vessel's safe operation if equipment fails.

Tanker traffic in the Straits and Port Angeles Harbor will comply with a comprehensive, uniform system of traffic regulations for operation of tank vessels engaged in transportation of crude oil in the navigable waters of the State.

All operators of oil terminal facilities must obtain an annual certificate of risk avoidance issued by the State. Operators of tankers carrying crude oil must also obtain such a certificate if they meet any of the following criteria: (1) transport oil to or from an oil terminal facility onshore or offshore, in state lands or waters, or (2) transport oil through state waters. Such operators must also submit proof of financial responsibility. The program discussed herein shall be developed through cooperation between the State and local governments.

An unexplained discharge of crude oil within the state of Washington's jurisdiction or in waters beyond the state's jurisdiction, will be removed by or at the discretion of the U. S. Coast Guard or the Governor of the State of Washington. Expenses involved in the removal of discharges, whether

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by the person causing the discharge, the person reporting it, or the State itself will be paid for under the provisions of the Comprehensive Liability Protection Plan (to be established).

Only tankers having segregated ballast will be permitted to utilize the Port Angeles oilport facilities. Individual ships will need prior approval to ensure that they have ballast tankage dedicated to seawater in an amount sufficient for seaworthiness (approximately 35 percent of cargo capacity).

Only tankers having inert gas or equivalent systems will be permitted to use the proposed berthing facilities. Vapor scribbing systems (e.g., using catalytic oxidation) that are equally effective could also be found acceptable.

Unloading operations shall be conducted in accordance with CFR Title 33 Part 154, 155, 156 and shall not begin until such time as the vessel or the terminal berth enclosure is fully boomed as a preventative measure against potential oil spills. A boom is also to be in place during bunkering operations and all internal transfer of oil or dirty ballast.

Oil spill contingency equipment will be permanently maintained in the Port Angeles Harbor at a site approved by local governments. Additional oil spill contingency equipment may be maintained at locations near the tank farm and/or along the pipeline route at the direction of local governments.

Consider requiring each ship captain to hold a current certificate of graduation from a U. S. Coast Guard approved tanker operation school.

equire proof of financial responsibility by tankers prior to entry into the Straits of Juan de Fuca.

Require construction and operation of holding tanks for water discharges (to eliminate discharge below waterline). Effluent should be tested prior to release. The terminal and the tank farm areas should include these holding tanks and be held accountable for the testing procedures to be conducted.

The BLM must address the question of oil spill liability in more depth. Some of the specific questions which must be answered are as follows:

1. At what point does Northern Tier assume responsibility for oil shipped to and from the port?
2. Who is responsible for oil lost at points away from mooring?
3. How will shoreline owners and harbor users recover (or try to recover) damages incurred through accidents caused by foreign registered ships?
4. Who is responsible if an accident occurring in Canadian waters results in oil washing onto U. S. property.
5. What fraction of the ships expected to call at the oil port are registered in countries which have agreed to the conventions adopted for use of sea lanes and dumping of refuse at sea? Not all countries have.

A comprehensive Liability Protection Plan should be established before the granting of the final State and Federal permits. This plan should consist of a comprehensive system of oil spill liability funds, surety bonds, and certificates of proof of financial responsibility to insure that adequate funds would be available immediately to pay for any and all damages resulting from the construction, maintenance, or operation of the oilport, oil tankers, and/or pipeline. This plan should be developed and administered by a board of persons including several local citizens and public officials. The use of a portion of the money provided by this plan should not require proof of fault.

Damages to be covered by this measure would include, but would not be limited to, the following:

1. Loss or damage to any property, public or private, real or personal.
2. Loss or damage to any plant or animal life.
3. Loss or damage to the profitability of any industrial or commercial business.
4. Loss or damage to any recreational resources.
5. Loss or damage to the health of any person.
6. Loss or damage to the environment to a degree that affects human health.

SOCIO-ECONOMICS

In addition to the mitigation measures outlined in the BLM-DES, the following measures should be considered as conditions for granting permits to Northern Tier.

Consider requirement of developer to fund continuous monitoring of air and water pollution levels. Possibly Peninsula College could introduce a student-participation program to give on-the-job-training to students in relevant programs. The developer should be required to submit a plan to local governments for approval regarding such monitoring programs.

Consider the development of a developer-sponsored fund which would be utilized to compensate recreations, tourism and retirement industry interests should there ever occur a project-related event (large oil spill, explosion, severe air quality problems, etc.) which results in a detrimental effect upon their industries. It is possible that even the fact of construction and operation of a major crude oil transshipment facility and any related industries may result in a measureable impact upon those industries.

Consider requiring the developer to submit a funding plan to cover the costs incurred by local governments for the administration of general and special purpose local government related to the primary and secondary impacts of the project.

Consider requiring the developer to initiate training programs for area residents meeting a pre-determined residency requirement to ensure that area residents would have the requisite training and experience to quality for employment during the construction phase of the project.

**CONT**

Consider the developer to fund legal research and the drafting of appropriate safeguards to ensure local hiring if that is desireable to local governments. Constitutional arguments limited the effectiveness of such policies in Alaska.

Consider participation in the selection of materials to be used in the construction of the project, if such participation would be beneficial to assure a higher level of quality control in the construction.

Developer should fund local governments in their efforts to research current and future impacts related to the project.

Consider possible reimbursement to local mills of a portion of their costs over recent years (and share of future costs) for pollution abatement (air and water). Certainly if air or water quality standards are lessened or waived for the proposed oilport (and any related indusries), local mills should be reimbursed some of their costs in attempting to meet those standards. Also, the proposed proponents might be required to fund local industry to compensate them in the case that pollution levels are raised to a point where local industry is precluded from future expansion.

The port authority should be funded to construct and operate a new facility to include the latest technology in vessel traffic control including vessel inspection and communications systems.

Sufficient space in the harbor should be designated to assure adequate facilities for loading of logs onto those ships which load from the water rather than dockside.

Developer should be required to fund administrative assistance to local governments to apply for and administer government and private impact funds.

Consider possible system of financial aid paid for by the developer to cover established residents costs incurred for future rental or home purchase as a result in property value inflation resulting from this project and related secondary development inpacts. Certainly low income and fixed income residents will be impacted by the impact of the project on the real estate market particularly during the construction phase.

Consider possible implementation of a pre-determined formula of tax relief to all area property owners if the real estate market inflation exceeds a pre-determined projection (based upon existing escalation).

Consider possible contribution from the developer to construct new foundations under the downtown commercial buildings which have been determined in the recent study to have substandard foundations. Such reconstruction of foundations might be evaluated a reasonable safeguard to mitigate potential structural damage which might result should there ever be a tanker explosion in the harbor.

Consider requiring the developer to initiate training programs for area residents meeting a pre-determined residency requirement to ensure that area residents would have the requisite training and experience to qualify for employment during the construction phase of the project. Also, training should be offered to area residents so they may qualify for employment during the operation phase of the project.

Consider the developer to fund legal research and the drafting of appropriate safeguards to ensure local hiring if that is desireable to local governments. Constitutional arguments limited the effectiveness of such policies in Alaska.

Consider participation in the selection of materials to be used in the construction of the project, if such participation would be beneficial to assure a higher level of quality control in the construction.

Developer should fund local governments in their efforts to research current and future impacts related to the project.

In the case of air or water pollution or other problems related to the oilport facilities, causing injury to property use or value, the NTPC should be required to reimburse the property owner for damages sustained. In some cases this may entail costs of purchase of homes, businesses, alternative residential or other land use areas, continuing public or private nuisance payments, etc.

If the relocation of any harbor uses becomes necessary, NTPC should fund such relocation. For example: relocation of Thunderbird Boathouse; the Salmon Club; the Foss Tug and Barge Operation, etc.

If retained in the present condition, the city road on Ediz Hook will require a continuing major maintenance program during the construction phase and major reconstruction after the construction phase. NTPC should pay appropriate maintenance and reconstruction costs to the City of Port Angeles (to be negotiated with the City).

If the Ediz Hook road is reconstructed prior to the NTPC project siting the City should be provided funding for NTPC to allow the necessary higher standard of construction to be included in the road construction project. If site, NTPC should provide the city with adequate funding to properly monitor road impacts during NTPC related construction and pay for appropriate maintance as needed. Following completion of the project, the NTPC should fund any reconstruction of the road (as with all city and county streets and roads which are damaged as a result of NTPC related construction) necessary to meet the pre-existing road standard.

Pre-payment of taxes may be negotiated with NTPC, if desired by area local governments.

NTPC should also provide on a 24 hour basis a full time, trained fire fighting crew for its equipment and facilities. NTPC should provide in writing that it would make this equipment available to the whole harbor at no cost to the County and City.

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NTPC should provide, in writing, that it will have avail- 24 hours daily, a full time trained crew and equipment for clean ups in the event of any oil spills. This would be at no cost to the City or County.

NTPC should provide in writing its status as to log booms in the harbor and its arrangement with Crown Z, ITT Rayonier, and the Coast Guard Station.

NTPC should provide in writing that it will shut down its tanker operations during Salmon Derby events identified as the Annual Salmon Derby. One derby for adults and one for children.

NTPC should provide in writing that it would adjust its peak construction period, either prior to the tourist influx or after.

NTPC should pledge in writing to support local, state, or federal government efforts to enact state or federal legislation related to taxation concepts or fees, such as a barrel tax or tonnage fee, which could be used to fund the local, state, or federal governments and/or establish liability funds, marine resources, baseline inventories, resource recovery funds, monitoring programs, oil spill clean-up programs, and other purposes which the local, state or federal government shou'd propose.

TOURISM/RECREATION

Require the developer to submit a plan for local government approval which would provide for the relocation of any recreational facilities caused by the construction and/or operation of the oilport or related development. For example, the utility of the boat launch at Ediz Hook would probably be severely restricted during the construction phase and possibly during the operation phase. It could be eliminated altogether. Compensation to the local community and recreation and tourism industry interests should be planned if such contingency should arise.

Consider requiring the developer to submit a plan for local government approval addressing beautification of the harbor area as compensation for the location of industrial facilities within the harbor. Not only should compensation for any eliminated facilities be addressed, but also betterment and increase of existing facilities should be addressed.

Tourist facility owners and employees should be provided for in the case of a major oil spill impacting this industry.

TRANSPORTATION

To minimize the impact on transportation routes, the developer should submit, prior to construction, to the county and cities for approval a plan designating alternate and detour routes to be utilized when roads are disabled due to construction.

Applicant should provide funding to cover additional administrative costs to local government agencies related to the project. For example, additional engineering and inspection personnel must be retained by the cities of Port Angeles, Sequim and Clallam County to assure proper quality control on road work, utility repair, traffic control planning, etc., etc.

The applicant may be required to pay the costs of operating a traffic control (planning, information, complaints, etc.) office to assist local governments mitigate transportation impacts.

There should be a $500,000 bond posted by Northern Tier Pipeline Co. to insure any possible necessary repairs to road crossings during the first year after they are made.

It should be a requirement of the permits issued to Northern Tier, that the Clallam County Road Department be consulted about traffic interuptions caused by construction activities. Also, that the contractors working for Northern Tier Pipeline Co. shall furnish signing out traffic control as directed by the Clallam County and the cities of Port Angeles and Sequim.

BLM touches on mitigating measures for traffic impacts based primarily on mitigations stated in the NTPC Washington State application. One area which neither one addresses is onsite parking for both workers vehicles, and construction vehicles and materials.

To keep traffic congestion on Ediz Hook to a minimum, on site (i.e. off street) parking is a necessity and should be proveded by the applicant.

Require that the applicant provide adequate compensation to State and local agencies with road construction and maintenance responsibilities in the case that the construction and operation of the oilport and related development results in a relocation of log storage areas and where such relocation causes an additional burden upon the existing road system in pre-existing conditions and standards.

In all sections of pipeline construction, watering will be required where appropriate to control dust.

To relieve traffic congestion, construction-related traffic should be limited during periods such as the "rush hour" and the off-loading period related to the Victoria ferry service.

Developer may be required to submit plans to local governments for prior approval of a system of mass transit of construction workers from housing areas to the various construction sites, including the pipeline route.

Existing roads will be utilized whenever possible in agriculture and timberland areas. Existing rights of way will be used or paralleled wherever possible when for roads, power, and pipeline. Compensation shall be given to local governments for damaged roads and bridges. Heavy vehicles will be required by the County to use selected roads and streets in order to minimize damages.

UTILITIES

The applicant should propose a treatment process and methodology to treat the hydrostatic test water if bacteriocides are used.

Applicant must submit plans for one approval of proper local governments regarding the disposal of construction and operation phase wastes.

To process petroleum related wastes resulting from the proposal, the applicant shall bear costs of purchasing, installing, maintaining and operating proper equipment.

CONT

WATER QUALITY

Chemical analysis of hydrostatic test water will be made to determine treatment needed, and disposal will conform to federal, state and local discharge requirements.

Water diversion or containment levees and ditches will be restored to their original compaction and configuration following construction.

Area residents are gravely concerned about the potential consequences of even a small oil spill in the watershed. We must insist upon a full public evaluation of the water quality and public health effects of an oil spill on watershed, river crossing, and acquifer areas.

In the event of any break in this pipeline, there will be serious and great financial loss to water quality and irrigation systems.

One of the prime concerns of area residents is just what will the remedy be for people in the event of a pipeline break? What will the insurance provision be as to liability? A bond should be required for damages from any spill.

During construction and abandonment discharge sediment traps should be required to prevent debris from entering rivers from pipe cleaning, storage tank cleaning, etc.

The Clallam County P.U.D should be contacted regarding mitigating measures necessary to insure an adequate amount and quality of potable and fire water. Such mitigating measures should be established prior to any permits being granted.

Mitigating measure: the pipeline may traverse several canals, laterals and drains connected to existing irrigation district systems. The various irrigation districts should be contacted and they should participate in the scheduling of construction so as to minimize impacts to the irrigation systems and users.

Special problems may be encountered if an oil spill should enter an irrigation system. Canal waterways distribute water to smaller laterals and canals reaching a wider area. Irrigation districts should be contacted and special oil spill contingency plans should be developed to minimize the impacts of such a spill.

WILDLIFE/PLANTLIFE

Unless otherwise directed by local governments or landowners, pipe will be buried to prevent influencing animal distribution.

Wherever deemed necessary by local governments or landowners, crossovers of open trenches will be furnished during construction, thus allowing the unhampered movement of animals.

River crossing sites will be constructed as to avoid disturbance of wildlife and conserve wildlife habitat as much as possible.

The Olympic National Park has many unique aspects. The protection of such assets requires that mitigating measures should be developed where appropriate.

Section 4.9; Page 4-4; Para. 1
The first sentence is a contradiction of numerous comments relative to the storage tank farm destroying critical habitat for the bald eagle which is a threatened species.

If the project sited, with the tank farm located at Green Point, the applicant must be required to fund mitigating measures recommended by the U. S. Fish and Wildlife Service to minimize impacts of the project on the bald eagle habitat.

The large-scale impact involved in constructing one thousand five hundred and fifty miles of pipeline, as well as an oil-port and storage facilities, demands close and serious attention to both the advantages and risks.

Any company that dismisses serious ecological questions with generalizations about the common forest types of Western Washington is ignoring its responsibilities.

We have a right to assume certain standards of performance, but Northern Tier has failed to meet minimum standards. They should be required, at the very lease, to:

1. Conduct ecological studies on the site, with a minimum of dependence on aerial photographs and a maximum of on-the-ground search with attention to individual species.
2. Produce site descriptions which include, at the least, species inventories and the delineation of any unusual features.
3. Specifically identify sensitive areas on, or adjacent to, construction sites, and outline reasonable measures to safeguard such areas.
4. Be well enough informed about the rare or endangered plants of the area to conduct a useful search.
5. Carry out botanical studies in the growing season. What can anyone expect to learn in February and April?

Before issuance of a construction permit, a field search will be made for endangered and threatened plants and animals by personnel of the Bureau of Land Management or its agent after the center line right-of-way description and other site specific locations for pump station and ancillary roads are made available. If any endangered or threatened species are encountered in the field survey, a biological opinion will be obtained from the regional U. S. Fish and Wildlife Service office regarding the regulation of those species and their habitat. Also, a biological opinion will be obtained from the appropriate state fish and game departments regarding the regulation of state recognized rare and endangered species encountered during field survey.

As a mitigating measure for distruction to flora as a result of air pollution from the facilities, constant monitoring by research teams and revegetation to damaged flora should be required.

Mitigation: A bond should be posted that would provide insurance for possible ecological damage resulting from possible accidents, (i.e., contamination of Dungeness Spit and possible loss of waterfowl populations, marine resources, etc.). The aesthetic appeal and tourism and recreation economics could be significantly impacted with a major accident and we should be assured compensation in such event.

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APPENDIX A

CRITICAL EVALUATION
of the
DRAFT ENVIRONMENTAL STATEMENT
CRUDE OIL TRANSPORTATION SYSTEM

Prepared by the
U. S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

Prepared for
THE CLALLAM COUNTY/PORT ANGELES
COMMUNITY TASK FORCE

by
REED E. HANSEN
THE URBAN INSTITUTE

March 1979

Item - by - Item Review of Socio-Economic Sections
of the BLM-DEIS Chapters[1/]

1. Description of Proposal. [A description of the proposed action, a statement of its purposes, and a description of the environment affected, including information, summary technical data, and maps and diagrams where relevant, adequate to permit an assessment of potential environmental impact by commenting agencies and the public.]

Comment/Additional Information Needed

① • Under subsection 1.1 Introduction and General Project Description (Page 1.1), the Northern Tier Pipeline Company (NTPC) is described as "a consortium of eight independent companies." In order to adequately asses the capability of NTPC to undertake the proposed system, information should by provided on the nature of the companies which form the consortium, including name and description of experience in oil marketing and transportation fields of each member company.

② • Under subsection 1.2 Purpose of Proposed Action (Page 1-4), discussion on supply shortage in the Northern Tier states indicates a shortfall of 600,000 to 700,000 barrel per day by 1985 and dependence on the Mid-Continental Pipeline to close this gap. The allegation of shortages of this dimension is not supported by the recently released (and preliminary) study conducted by the U.S Department of Energy on current and future supply/demand conditions related to oil energy in the Northern Tier States. The DOE forecast crude supply shortfall is approximately 300,000 barrels per day by 1985. While it is possible that the DOE findings seriously underestimate the level of the shortage of crude oil faced by the Northern Tier States (NTS), potentially the NTPS could be forced to operate at far below its design capacity. It would be prudent, therefore, to require the NTPC to conduct market studies related to the sale of crude oil transported by the proposed system. Given the nature of the industry structure of refining and marketing in the NTS, such market analysis should focus on the Chicago area for a determination of demand conditions for crude oil carried by NTPS. Similarly, if the DOE forecast estimates withstand critical evaluation, it would be desirable to consider the potential for increasing the capacity of the Mid-Continental Pipeline system.

③ • Under 1.4 Proposed Action (Pages 1-9 and 1-10), off loading booster pumps are to be operated by electricity provided by Port Angeles Electric Utility. Until thermal power is available from the Washington Public Power Supply System, the City may have problems supplying the necessary electricity to operate booster pumps at the off loading facility. Apparently the City electric authority

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③ and NTPC are attempting to formulate a solution. However, if electric supply is infeasible, NTPC may substitute gas turbine driven pumps for the proposed electric. This possibility should be developed further, as it would impact the natural environment (in pollution, noise) and result in the need for major fuel storage facilities.

④ • Under 1.4 Proposed Action (Page 1-10), fire protection systems for the marine facility are indicated, however, without mentioning the basis (standard) for the fire protection procedures and facilities.

• Under 1.4 Proposed Action (Page 1-10), the DEIS describes the bunker fuel unloading procedures related to the marine terminal operation. The DEIS should provide for the likely adoption of bunker storage facilities at the terminal facility.

• Under 1.4 Proposed Action (Page 1-11), the DEIS indicates that NTPC would utilize the services of the Clean Sound Cooperative (CSC) in case of a major oil spill. Discussion should be provided indicating the current capability of the CSC to respond to a disaster at Port Angeles, and the possible requirement of additional personnel and equipment by CSC in order to adequately protect the Port Angeles area in case of a catastrophe.

⑤ • Under 1.4 Proposed Action (Page 1-15), fire protection systems for the storage facility are indicated. However, no standard of fire protection for this type facility is mentioned. The DEIS also indicates that fire protection procedures and detailed design of protection systems have yet to be developed. Given the potential hazards, development of an appropriate fire protection system for the terminal and storage facilities, based upon state-of-the-art methods, should proceed at once as a pre-condition of acceptance under the Federal EIS review process.

⑥ • Under 1.4 Proposed Action (Page 1-40), Table 1.4 - 18 provides number of Construction personnel required for marine-terminal and storage facilities based upon NTPC figures. Apparently BLM accepts the workforce levels indicated by NTPC. There is no indication of an independent evaluation, which would be appropriate. Similarly, construction workforce estimates for the pipeline and pump stations, is provided by NTPC, should be verified.

⑦ • Under 1.4 Proposed Action (Page 1-48), discussion of operation and maintenance, there is no indication of permanent manning levels. Such permanent workforce data should include: number of permanent NTPC personnel, number of ship-board personnel likely to designate residence in Port Angeles area, number of contract personnel required to reside in Port Angeles area on average.

⑧ • Under subsection 1.4 Proposed Action (Page 1-53), BLM DEIS refers to a cost analysis conducted by DOE in which installation labor is not expected to exceed 6 percent of total cost. As a rule of thumb, construction labor represents about 1/4 of total costs for major capital intensive projects. The discrepancy between the two figures is significant for two basic reasons: 1) the financial integrity of the project might be called into question and 2) estimates of number of construction personnel and consequently local community impacts might be seriously underestimated.

⑨ • Under subsection 1.4 Proposed Action (Page 1-56), the discussion on additional measures proposed for environmental protection indicates NTPC's decision to station a manned fire boat at the marine terminal and fire truck at the storage facility. Additional information is needed on whether the fireboat and truck will be turned over to the municiple authorities, or operated privately by the company. If the latter is decided, information should be provided concerning the restricted use of the equipment. Clarification should be provided on whether the manpower requirements related to fire protection of the NTPS facilities are included in the calculation of total permanent personnel figures.

⑩ Similarly, within the same section, the BLM DEIS indicates that the NTPC will establish procedures for assuring in-port use of low-sulfur bunker oil. Since the use of low-sulfur oil is assumed in estimating air pollution impacts of the terminal facility, the legal basis for ensurring the adoption of the procedures outlined in the DEIS should be determined.

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[1/] At the beginning of each section reviewed, the first sentence of the required contents of environmental statements is excerpted from the U.S. Code of Federal Regulations.

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11 • Under subsection 1.4 Proposed Action (Page 1-58), the DEIS discusses procedures regarding establishment of plans for meeting local labor and housing demands associated with the construction phase of the marine terminal, storage facilities and pipeline. Since employment conditions and, especially, housing are of paramount concern to the communities within the impact area, as regards the potential impacts of the NTPC proposal, information on these items should be collected (including estimates) as part of assessing the impacts of the proposed action and not wait until approval has been granted by the relevant agencies.

12 • Under subsection 1.5 Interrelationships with Other Projects, Plans, and Policies. (Page 1-62), the BLM-DEIS briefly describes the alternative Kitimat Pipeline Proposal, in which it is stated that a recent study (completed in 1978) of Canadian crude oil resources concluded that heavy crude oil development in Canada eliminates the need for a West Coast Transshipment point. A major reason for the proposed NTPS is the shortfall of oil to the NTS resulting from Canadian Oil Curtailment Program. The conclusion of the above study tends to contradict this assumption. Therefore, this study should be examined as part of assessing the overall need for the proposed pipeline system.

2. Description of the Environment. [The relationship of the proposed action to land use plans, policies, and controls for the affected a....]

Comment/Additional Information Needed

• Under subsection 2.1 Existing Environment (Page 2-5), the BLM-DEIS states that data on sulfur dioxide levels is of poor quality. Since 1974 the Washington State Department of Ecology has monitored sulfur dioxide levels in the vicinity of the ITT Rayonier Plant. The results of this effort have been challenged by EPA. Also, no data exist on nitrogen oxides, carbon monoxide, or ozone in the Port Angeles area

The absence of good baseline data in this connection would make it difficult to determine the relative impact of the NTPS project on air quality in the Port Angeles area. The issue has especial importance to the economic life of the Port Angeles/Clallam County community because of the potential impact of air quality changes on major local manufacturing industries, both in terms of maintaining present production and employment levels and possible future expansion of their facilities.

13 • Under subsection 2.1 Existing Environment (Page 2-13), the BLM-DEIS states that ground water is generally abundant in the vicinity of the onshore storage facility. However, it fails to mention the existence of any publicly operated domestic water wells in the area, of which the Clallam County PUD apparently operates two wells in the area, nor of the possibility of salt water intrusion into the aquafiers should additional capacity be added to the area.

14 • Under subsection 2.1.1.12 Land Use (Pages 2-28 through 2-31), the BLM-DEIS provides a brief discussion (including map delinlating land use of Port Angeles area) of base-line land use practices and policies within Port Angeles and Clallam County. However, there is need for substantive information on the following points:

(a) land use planning goals and policies adopted by the communities;1/
(b) consistency and compatibility of the proposed project with adopted land use plans and policies;
(c) provisions of Clallam County Shoreline Master Program with respect to potential impact areas;
(d) consistency and compatibility of the proposed project with the Clallam County Shoreline Master Program;
(e) issues involving the legal affect of local land use plans and policies (including the provisions of Clallam County Shoreline Master Program);
(f) land use goals and plans of the Port Angeles Harbor District;
(g) specific data on scope of residential development already planned in the ajacent to the crude oil storage facility and;
(h) land use policy implications of large-scale temporary housing requirement for construction workforce.

15 • Under subsection 2.1.1.13 Transportation and Utility Networks (Pages 2-32 through 2-36) the BLM-DEIS discusses the existing road and highway network in the Port Angeles area. The section on road and highway network requires considerable expansion in order to establish a baseline information base on

CONT 15 which to compare NTPS project impacts. Figure 2.1.1.13-1 provides annual average daily traffic (ADT) figures on selected road segments for the Port Angeles area in 1976. The analysis should be expanded to include roads which are likely to be impacted by project related residential as well as construction traffic. In addition to ADT figures it should include peak hourly volume traffic figures, in order to provide a reasonable comparison with road capacity values (design hourly volume - DHV). These data should be provided for peak seasonal volume (summer) as well as annual average traffic.

The traffic growth factors indicated in the environmental statement for the Port Angeles area appear to low, even assuming relatively low population growth rates in the future. Traffic can expected to grow at a fairly high level for several reasons: increases in population, increases in tripmaking per household brought about ~~primarily because of~~ increased auto ownership, and increased tourism/recreation travel.

The BLM DEIS contains information on service levels for a limited number of road segments. The discussion should take into account City and County road management plans and policies. The comprehensive plans for both governmental units indicate a high priority for improving traffic circulation.

The DEIS does not mention the existence or lack of a public transit system or the communities' plans and policies in that regard.

Finally, as part of baseline data on transportation, the environmental statement provide information on the condition of highway and County and City roads in regard to potential heavy truck loading associated with the proposed project. Such information should indicated type of road, road weight capacity, and level of maintenance for segments likely to be affected by construction of the proposed project.

• Under subsection 2.1.13 Transportation and Utility Networks (Pages 2-35 and 2-36), the DEIS provides information on electric transmission capabilities in the Port Angeles area. The discussion recognizes the difficulty of forecasting power supply in the region.

Availability of electric power to NTPC is contained by several factors:

(a) Bonnevill Power Authority (BPA) allocations under current contracts;
(b) BPA alloctions after expiration of current contracts;
(c) availability of nuclear power from WPPSS; and
(d) accuracy of local forecast by City and County.

16 Present and forecasted electrical loads for the City and county are shown in the DEIS, based upon ERT estimates. Relevant dates do not accompany the forecasted loads. This should be corrected.

Since a future power shortfall is clearily a possibility, NTPC could reduce its electric power demand substantially by adopting gas turbine driven booster pumps at the marine terminal for oil off-loading operations. This alternative should be considered in the impact assessment process, because of the implications for air quality, noise, and land use developed (increased fuel storage requirements associated with turbine pumps).

17 The DEIS does not provide information as to the legal requirements on local utilities regarding electrical power deliveries to energy transportation projects. Reference to specific citations of law and relevant court opinions on this issue should be provided.

18 Presumably, under existing Washington State law NTPS would not be subject to interruption of electric power. Therefore, almost certainly there would be times when other power customers, including residential customers, and businesses and manufacturers (not enjoying non-interruption protection) would be subject to interruption, with potentially severe consequences. According to the DEIS, critical water year situations affecting power availability occur one year in ten. The potential impacts of such an occurance, given heavy power demands on the part of NTPC, should be given consideration. The heaviest impacts would probably fall on heavy manufacturing, i.e., the paper and plywood industries, which are major employers in the Port Angeles area. An extended period of power interruption to these industries might result in a substantial drop in employment, income, and municiple revenues, and a consequent increase in public service outlays.

The EIS does not discuss the effect of power demands of NTPC on local

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1/ The comprehensive plans of both Port Angeles and Clallam County contain prohibitions against the development of a major oil port and storage facility. No specific reference to these significant policies is made.

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CONT 18 area rates. Reasonable concern could be voiced about the effect heavy power demands might have on the community rate structure.

Incremental pricing appears feasible, and accordingly the electric utility authorities intend to price power provided to NTPC at thermal rates (which reflects incremental cost to utility of purchasing power from WPPSS).

• Under subsection 2.1.1.14 Recreation Resources, the BLM DEIS presents a brief description of available recreation resources together with some

19 indication of human utilization of those resources. It does not, however, provide a comprehensive assessment of the relative importance recreation has for the local area economy especially with respect to tourism, a local growth industry.

Availability of extraordinary recreation resources makes the Port Angeles area a major tourist attraction. The natural environment offers opportunities for a variety of recreation activities found in few places in the country. Boating, sport fishing, beach combing, climbing, hiking, sight seeing, to mention a few activities, are available to the local residents and visitors alike. Recent growth in the non-manufacturing sector of the area economy reflect the increasing importance of recreation and tourism.1/ Therefore, preserving this major resource is a major concern of the community as regards to the potential impacts of the proposed oil port facilities.

These are a number of socio-economic variables to be considered in developing a baseline source of information for assessing the impact of the NTPC proposal. But first it should be understood that the tourist industry is classified as a primary or basic industry. This means that income generated from tourism not only increases the employment base in that industry, but through the income-expenditure stream of the local economy will stimulate employment in the service sector or non-basic industry (this is commonly called the multiplier effect). The same relationship applies to the income generated from retired in-migrants. Income received from annuities, pensions and government transfers by retired in-migrant households creates a demand for goods and services, resulting in secondary employment growth. The foregoing points are important to understanding the importance of the recreation/tourist/retirement related industry to the local economy.

Some of the important baseline economic variables include: the number of visitors each year and average length of stay; average visitor expenditure per day; number of non-resident vacation housed constructed and average value of residence; employment and payrolls in tourist related industry. Information of this sort should be provided (if possible) over a period of several years in order to develop a growth profile of the industry. As one source of data on employment and wages, the Department of Employment Security publishes annually and quarterly Employment and Payrolls in Washington State By County and By Industry.

20 Because certain recreational facilities on Ediz Hook stand directly in the way of proposed oil port, i.e., the Salmon Club Boathouse and public landing facility, they should be clearly indicated on a map included in the environmental statement.

• Under subsection 2.1.1.15 Social and Economic Conditions (Pages 2-28 through 2-46), the BLM DEIS presents information on vessel activity on the Strait of Juan De Fuca, and Port Angeles harbor area population, income and employment, housing, community services, and social conditions.

21 Data on vessel activity shown in the environmental statement should be supplemented with vessel activity and commercial value (dollar amounts) data related to the harbor. Both existing and projected future vessel traffic, related to harbor use should be provided. The harbor also services as a refuge for in-transit vessels as indicated by the DEIS. Information on present anchorage capabilities and utilization rates for this purpose should be provided. Finally, a discussion of potential and planned future harbor uses should be provided in the environmental statement.

22 Baseline information concerning population is incomplete and poorly

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1/ Moreover, Clallam County has been "discovered" as an ideal retirement community by people across the nation. In recent years retirement related in-migration to the area has been heavy. Obviously, the recreation opportunities afforded by the area contribute to this phenomenon.

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CONT 22 presented. Population trends by age groupings for Port Angeles are presented in a graph (Figure 2.1.1.15-1). However, this information is largely meaningless, because absolute population values are not shown. Population distribution by age is shown for the decennial year 1940 through 1970 (total population for 1976 is given) for Clallam County. No population figures for Sequim are shown.

23 In order to adequately assess the impact of the NTPC proposal additional population information is needed. The information should be provided on the three major jurisdictions most likely to be impacted by the proposed project: Port Angeles, Sequim and Clallam County. The required data include: total population, population by age, sex, ethnic background. The data should be arranged to reflect growth patterns, including overall rates of growth and the make up of the population. With reference to the latter, recent population trends indicate an increasingly high proportion in higher age brackets, this is a reflection of heavy retirement in-migration to the area. In addition, forecasted rates of population growth should be a part of baseline information. Population forecasts are necessary, inter alia, for making comparisons of the relative impacts of the proposed action on public services and revenues.

24 The DEIS supplies a breakdown of employment in Clallam County for 1975, including the annual average unemployment rate for that year. This information should be updated to reflect current conditions where possible. Employment data by industry is available in Employment and Payrolls in Washington State By County and By Industry, published quarterly by the Employment Security Department, Washington State. Generally there is a nine month lag in the publication of this data. Current unemployment rates are available monthly from the Department's local area employment offices.

25 Because of the NTPC's stated determination to hire construction workers locally, as part of mitigating the impact of the construction phase, information should be made available on the existence of local union labor halls in the Port Angeles area, including a list of the union occupations that are represented. In addition, an occupational profile of the current laborforce should be provided in order to determine the availability of labor with appropiate skills in the area. This may require an on-site survey, as comprehensive occupational data is typically available only from the decennial U.S. Census.

26 The section on local government fiscal capacity requires considerable expansion in order to be able to assess the relative impact of the proposed action on local government expenditures and revenues. Fiscal data should be provided for all local governments and taxing jurisdictions in the impact area, i.e.: Clallam County, Port Angeles, Sequim, and affected school and junior taxing districts. This data should consist of revenues by source for 1977 in each jurisdiction. Since the property tax is a major component of local revenues for most jurisdictions, detailed information on assessed valuation, levy rates, taxing limitations with and without voter approval, and bonding capacity should be covered. Special limitations on the revenues base, such as, the 106 present limitation on county and city governments imposed by the State, or the potential loss of the forest yield taxes to the County due to diminished State Timber sales, should also be discussed.

27 Similarly, the housing section needs expansion. Additional data should be provided for the major impact areas- Port Angeles, Sequim and Clallam County (unincorporated). Data requirements concerning general housing conditions include:

(a) Population in dwelling units
(b) Owner/Renter split
(c) Vacancy rates by type of dwelling unit
(d) Housing trends by structure type
(e) Building permits (recent years) by location
(f) Housing assistance needs of lower income households
(g) Special housing- motels, hotels, boarding housing

In addition, recent housing cost data should be supplied covering average single family housing valuation, average cost of new construction (single family), rental values by size of unit, and average annual inflation rate (recent years) related to housing values and rents. Since, housing demands associated with construction of the proposed project are likely to result in sharply increased housing costs (especially for rental units), the DEIS

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27 should provide comparative information on the experience of other areas of similar size and geographic isolation which have been impacted by construction projects of the type proposed.

Baseline information presented in the environment statement on community services and resources contained in the DEIS provide enough detail to enable a comparative assessment of project impacts.

28 With respect to schools, information should be supplied on each of the school districts lying in the impact area: districts No. 121 (Port Angeles) No. 313 (Crescent), and No. 323 (Sequim). Baseline data should include:[1]

- (a) enrollment by grade profile (current year and historical)
- (b) current year pupil/teacher ratios by grade;
- (c) physical capacity designated as either standard or substandard as determined by the State Superintendent of Public Instruction;
- (d) enrollment projections and capacity projections.

29 Baseline water supply information should be supplemented with detailed summaries of the water systems likely to be impacted by the proposed facilities and related populations. At a minimum the information should reflect the following general system characteristics: type of system, source of water, capacity, number of connections by type, current average and maximum usage (gallons per day), maximum capacity and unused capacity. In order to estimate potential financial impacts, information regarding customer water rates, connection charges, and capital financing should be included.

Given the potential heavy demands on the Port Angeles water system related to supplying potable and ballast water to ships-in-port, data on current use and capacity of the water line on Ediz Hook is required.

30 Sewerage system baseline information related to the City of Port Angeles is presented in the DEIS. This should be supplemented with a discussion of sewerage system likely to be impacted in the County and City of Sequim. The discussion should consider peak and average capacity, (gallons per day) peak and average flows, and plans for system improvements and expansion. The Port Angeles system does not provide waste treatment for industrial wastes, hence a discussion of available methods of treatment of industrial waste in needed. Finally, information should be provided on user fees, connection charges, and capital financing for each sewerage system under consideration. This is important for assessing financial impacts of the proposed facility on community services.

Solid waste is not discussed by the DEIS. Potential construction wastes related to NTPC project are large. Hence baseline information on the location and capacity of solid waste sites is important. Moreover, during operational phase the facility is likely to generate solid waste substances which may be incompatible with solid waste capabilities in the area. Therefore, a discussion of absorption capabilities of existing sites should be indicated.

31 Baseline information of fire protection in the DEIS is limited in scope. It should be expanded to include detailed inventory of fire fighting, and emergency vehicle equipment, manpower, training, activity levels (including response times) and protection status /population served, in service area, and property type and valuation, fire insurance grade for each department or district likely to be impacted by the proposal. The discussion should indicate the location of station, general condition of equipment, and plans for improvement and expansion to upgrade capabilities or meet the demands from population growth. Since independent fire districts are self-financing, information concerning current financial structure, including method of capital financing, tax rates, tax limitations and tax base, is needed to assess financial capability to absorb increasing demands related to the proposed project. The information base should also indicate State average service levels in terms of fire protection for similar size communities.

32 Police protection information should be supplemented with the inclusion of data on crime patterns in the county. One source of information for this data is the FBI Local Crime Reports. Data on manpower, equipment, facilities, and manpower/population ratios should be presented for each department (County Sheriff, Port Angeles Police Department, Sequim Police Department, State Highway Patrol). The information base should also indicate State average service levels of police protection for similar size communities.

Health Care information contained in the DEIS needs expansion in order

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[1] The BLM DEIS contains enrollment and physical capacity figures in 1976 for the Port Angeles and Sequim area public schools.

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33 to determine service standards and capability to meet health care demands associated with the project. Information should be provided on the following items: number of primary care physicians; ratio of primary care physicians to population; utilization rates (number of patient care days per thousand population); State standards regarding facilities for specific treatment, including alcoholism; comparative service levels based on communities of similar size and character; and local public finance of medical services.

34 Community service discussion on the DEIS should provide detailed information on types of services provided by relevant agencies, utilization rates, manpower and facility capacity and funding sources. In addition, information concerning availability of services in connection with day care facilities, service to elderly and services to low income people should be provided. Service capability with regard to the latter is especially important as the percentage of low or marginal income people may rise significantly during construction of the proposed facility as those persons are attracted to the area looking for work. The number of low income persons seeking help will undoubtedly increase along with competion for services, for which funding may not increase.

35 The section on amenities in the DEIS needs considerable expansion, especially concerning municiple park facilities and library service. Park information should include data on number of parks and acres/1000 population and financing for each jurisdiction. Information on library service should include current and historical information on books and materials budget, size collection, circulation and financing mechanism.

36 • Under subsection 2.1.2.15 Social Economic Conditions (along pipeline route) (Page 2-146), the DEIS presents economic baseline information in Table 2.1.2.15-6 County Economic Profile. Information on principal industry by county appears to be incorrect in a number of instances. For example, principal industry in Pierce and Spokane Counties is presented as government, when in fact, wholesale and retail trade is the principal industry in both counties, with manufacturing the second largest employer.

Gross property tax collections presented in the same table of the DEIS should be converted to per capita values in order to assess and compare property tax burdens of county residents along the pipeline route.

The DEIS discusses sales taxes exposed by the states and municipalities along the pipeline route. Further development of this discussion is appropriate. Washington state (plus counties and cities) imposes a sales and use tax. The distinction is important, as the local portion of the excise tax on sales is credited to the community at point of sale, if it occurs within the state, not at the point of delivery. For example, electric generators for pump stations manufactured in the East, say by General Electric, would be considered sold at the regional distribution point, if one exists. This would most likely be located in Seattle, King County, which would receive credit for the sale in determing local tax redistributions. The use tax applies to the point of delivery or use activity. Similarly, if there is no vendor sales outlet within the State, the sales tax on goods and services brought into the State would be applied at the point of delivery or installation.

37 • Under subsection 2.1.2.15 Social and Economic Conditions (Page 2-153), the discussion on fire protection is ambigious. Where as, most of the rural areas are serviced by volunteer firefighters, which is adequate for existing conditions, the protection they afford may not be adequate for the demands placed on them by a pipline system. Detailed information on fire protection, including facilities, manpower, equipment and response times should be provided for communities located near booster pump stations or other installation points where there is an increased fire hazard.

3. Impacts of the Proposal [The probable impact of the proposed action on the environment]

Comment/Information Needed[1]

Air Quality (Subsection 3.1.2, pages 3-2 through 3-8)

There is a positive correlation between air quality impacts and economic conditions. The two major industry sectors - manufacturing and tourism - are sensitive to air quality changes. Air quality is important to local manufacturing because of stringent government regulations which result in higher capital and operating costs and which reduce return on investment. Expansion of the economic base associated with this sector might then be out of question. Indeed, reductions in existing production and employment might occur. Air quality impacts on tourism are extremely difficult to quantify. Nevertheless, poor conditions would adversely affect the attractiveness of the area to visitors.

38 The analysis presented in this section focuses on air quality impacts associated with construction and operation of a 933,000 barrels per day throughput system.[2] This may lead to a significant underestimate of air quality impacts given several plausible scenarios concerning future industrial development in the area and NTPC system changes. The scenarios that should be incorporated into the analysis include:

- (a) possible alternative use of turbine powered booster pumps at off-loading terminal;
- (b) possible induced energy-related industrial development, e.g. refineries, in impact area;
- (c) possible expansion of local manufacturing industry.

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[1] Comments on impacts are subsumed under major topic headings without referring to section or page number, unless specific refference is made to a given paragraph.

[2] The impacts of expanding the system to accomodate transportation of crude oil to North Puget Sound refineries is deferred to the section on Short-Term Versus Long-Term Productivity.

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CONT

39 Noise (Subsection 3.1.3, pages 3-8 through 3-10)

The BLM DEIS does not consider the alternative use of fuel turbine driven booster pumps at the marine terminal. Because of possible constraints on availability of electricity, this alternative may be seriously considered by NTPC.

Aquatic Resources (Subsection 3.1.6, pages 3-14 and 3-15)

The DEIS discusses quantity of potable water required by ship, but does not consider water ballasting requirements and related impacts to the local water system. Ballasting requirements are generally 20 percent of ship holding capacity - a large volume.

The DEIS also addresses the impact of domestic water demands (4,000 GPD) at the storage facility. However, it should indicate system capacity of Agnew Fairview Water District No.1 to provide at required service levels. In the event that wells must be drilled on site to provide necessary water, the affects on local district water sources should be analyzed.

40 Land Use (Subsection 3.1.12, pages 3-34 through 3-41)

The DEIS addresses the impact of the port facility on existing log storage facilities, the pilot station, small boat mariner, and boat launch. With respect to impacts on log facilities the analysis does not develop the economic, traffic and air quality implications of using dry land log storage. Since this is a likely outcome, it should be analyzed completely.

Similarly the DEIS does not indicate the extent of impact in terms of economics or safety with regard to relocating the pilot station, small boat marina and boat launch in order to accomodate the marine terminal. More than inconvenience, these actions would probably result in real losses in economic resources.

The environmental statement does not consider the economic implications of change in land use at Green Point associated with the storage facility. Residential developments may be affected with loss of income and property value.

Indirect affects of the oil port, storage facility and pipeline should be considered. The possibility of the establishment of oil refinery capabilities adjacent to the oil port should not be discounted. A 250,000 barrels per day refinery would require 1,000 - 1,500 acres of industrially zoned land.

The DEIS does not discuss the pattern of residential development likely to be brought about by the in-migration of construction workers and operational personnel. This is a serious shortcoming as it is difficult to assess public service requirements and revenue sources related to population in-migration.

CONT

41 Transportation and Utility Networks (Subsection 3.1.13, pages 3-42 through 3-46)

The discussion inland water transport contained in the DEIS does not develop the implications of increased harbor traffic during the operation phase of the oil port or use of the harbor as a refuge. Given the expected level of project-related vessel traffic (340 calls per year), this could be a significant impact.

The DEIS presentation of road and highway impacts should be expanded to include assessment of impact on service roads to the storage facility and pipeline construction sites. An analysis of employment-related and residential traffic should also be undertaken. The impact analysis should also take into account increased traffic generated by induced industrial development; e.g., refineries.

Issues surrounding traffic circulation in the Port Angeles area, in light of community goals and policies, as represented in road management and comprehensive plans, should be given consideration by the environmental statement. the analysis should attempt to identify circulation problems exacerbated by the project that can be ameliorated through signalization, channelization or other non-major road improvements.

The discussion on electrical power in the DEIS presents a draconian outlook regarding supply of electrical service to NTPC in the Port Angeles area. It should further be pointed out that Washington State law protects energy development facilities against interruption of electric power. Hence, the impacts of a major electric energy shortage would fall on local industry primarily, not on NTPC. The result of electric shortages might be reflected in massive lay-offs for extended periods in those industries. Hence, NTPC is not simply another user of electric power as implied by the DEIS discussion, but rather enjoys privileged status in terms of energy utilization.

42 Recreation Resources (Subsection 3.1.14, pages 3-47 through 3-49)

The DEIS discussion does not attempt to quantify the economic value of recreational sources lost (including tourist industry losses) due to construction, and operation of the marine terminal and storage facility. Economic losses should be calculated in terms of employment, retirement in-migration, value of goods and services sold and public revenues. Recreation-oriented tourist industry is growing at a rapid rate and is expected to continue to grow in the future.[1] With that in mind, the economic loss associated with potential adverse impacts from the NTTS could be devastating to the community.

Social and Economic Conditions (Subsection 3.1.15, pages 3-49 through 3-55)

Construction Phase Population and Employment Impacts

Recapitulation:

According to the BLM DEIS, construction phase population in Clallam County would rise to a maximum of 1,100 during the first four months of construction. Average population during the 18 month period of construction would be approximately 525.[1] In addition, at the peak of construction activity, workers commuting from other counties would increase the daytime population in County by 300. Assuming a similar proportion of peak to average for construction-related in-migrants, average daytime commuter-worker population would be 143. The peak population increase including commuters would amount to approximately 3 percent of County population (based on 1977 population of 41,100). Accordingly average construction period population increase would amount to only about 1.5 percent of County population on the basis of this projection.

The methodology for determining construction phase population impacts, as presented in the DEIS, is reconstructed as follows:[2]

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[1] During the past few years the State of Washington has experienced higher than expected population growth rates due to heavy in-migration associated with an industrial boom period. Incomes have risen at a fast pace as well. Thus, recreational oriented tourism in areas like Port Angeles can be expected to grow dramatically.

126 CONT

(a) Initial phase construction workforce (709,000 barrels per day) data is distributed over 18 month period of construction.

(b) Construction workforce for Clallam County includes manpower requirements for terminal submarine pipeline, storage facility, and part of Section I pipeline.

(c) Local component of workforce estimated on basis of sliding scale relating-percentage of local population workforce to total population. The actual local workforce proportion of in-state construction phase workers is not given.

(d) Out-of-state component of workforce is broken out based upon average of 15 percent for all delivery facilities and 41 percent for pipeline.

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1/ Based on reconstruction of transient population data contained in Table 3.2.15-2 page 3-122.

2/ Based on General Economic Methodology for Construction impacts - page 3-119.

(e) Induce and indirect employment was estimated on the basis the Bureau of Economic Analysis "Guideline 5 Regional Cross Output Multipliers.[1] The multiplier values for Clallam County are not indicated.

(f) Indirect employment was distributed between local and non-local components in the same way as the in-state share of the construction workforce.

(g) Construction workforce and indirect workforce was combined to calculated total employment (non-local).

(h) Transient population (project-related immigrants) was estimated on the basis of survey data (Old West Commission) which indicated that 48.9 percent of non-local construction workers are accompanied by families of 3.61 persons (average size). Thus, transient population estimated at 2.278 times the number of non-local workers.

The average (over 18 month construction period) ratio of total construction workforce to total transient (in-migrating) construction related population is 1.82 (assuming a construction period average of 289 workers and average population of 525). The average ration of the non-local construction workforce to total transient population is 3.1 (assuming a monthly average of 170 non-local workers and average population of 525.

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1/ The procedure for generating indirect (service) employment assumes a 3-month lag for primary expenditures to result in generation of secondary employment.

Evaluation:

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In general, the material contained in the DEIS is not prepared in an easily understandable fashion. Nor does it contain enough detail to give the reader a basis for examining the methods and procedures used to estimate the population and employment impacts.

Before getting into detailed examination of methods, the point should be made that the impact data should be arranged in such a way as to permit a comparative examination of normal population growth, assuming no action and the incremental impact on the area concerned, assuming development of of the project. Hence, data reflecting current and projected population for both normal and project-related population should be arranged (on the basis of best estimate, failing a systematic approach) to indicate residential location. The only designation of location referred to in the DEIS is Clallam County (and other counties). This is necessary for estimating, land use, housing, transportation and utility and public service impacts in the affected communities.

In terms of methodological issues, a major weakness of the material presented is the failure to present the numerical values for some of the important relationships used to estimate employment and population impacts. For example, the proportion of local workforce to total in-state construction employment is not indicated for Clallam County. The DEIS states that the proportion is based on a logrithmic formula. Presumably Clallam County local workforce proportion is approximately 35 percent. The use of a scale

CONT 43

to estimate this relationship appears arbitrary, however. The local share should be based upon labor market conditions within commuting distances (usually a one hour commute is considered an outer limit). Comparative data on this relationship should be easily available, based upon within-state experience, namely construction of nuclear facilities in the Grays Harbor area. In any case, the figure 35 percent seems high.[1] Furthermore, the material on induced and indirect employment does not indicate the values of the employment multipliers used. Indeed, the use of multipliers for estimation of secondary employment impacts is a subject of controversy. There are several well documented limitations of this approach,[2] including the conclusion "a researcher can come up with any multiplier desired simply by trying different alternatives." Thus, a detailed description of procedures used and results obtained should accompany the impact assessment in the DEIS. The methodology has the additional weakness of failing to consider several critical factors which determine the level of population in-migration. One of thes is the in-migration of the unemployed seeking project related and indirect jobs. At the least, the current ratio of unemployment to total employment for the County should be applied in estimating in-migration related to this factor. Another factor relates to percentage of in-migrating households with secondary workers who are likely to fill direct and indirect jobs. There are other factors which affect the make up of the in-migrant population - including second job holders, replacement of retirees and natural increase - however, they probably are not significant in terms of the impacts generated by the NTPS proposal. Finally, the methodology assumes that marital status and family size of indirect workers as as proportion of local to total in-state workers are the same.

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1/ The Trident Fiscal Impact Study assumed a local share of about 6 percent of in-state construction workforce, the remainder being in-migrants or commuters.

2/ W.Cris Lewis, "Export Base Theory and Multiplier Estimations: A Critique," The Annals of Regional Science, July 1976. See also T. Muller, R. Hanson and J.Tilney, The Fiscal Impacts of Trident On State and Local Government, The Urban Institute, Washington, D.C.

The proportion of in-migrant construction workers with families -48.9 percent- and family size -3.61- are based upon Old West Commission experience. The values appear reasonable, however, the could be tested against within-state experience (nuclear facility construction). There is no reason to assume that indirect workers with accompanying families would be the same as construction workers. Rather the proportion should be similar to that of population within the State, or about 89 percent. Similarly, family size should follow the level of the State, about 2.7 persons per family.

Aside from questions on methodology there are the issues of comparability of the workforce projections applied in the DEIS and the failure to provide for any plausible scenarios regarding induced energy-related industry development in the area.

There is reason to suspect that the workforce projections are significantly underestimated. If one were to estimate the construction workforce on the basis of total project costs, assuming a total construction costof the terminal, submarine pipeline and storage facility of $125,566,000 (first phase), labor cost share of 25 percent,[1] average monthly construction workers salary of $3,000, and an 18 month construction period, the average number of man months required would be 581. This compares to an average of 289 as shown in the DEIS, or about double the workforce. Applying the employment to population relationship developed in the DEIS, the average population would also be about twice the projected levels or 1,050 per month over 18 months. Peak months population levels would be about 2,200,

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1/ See Thomas Muller, Economic Impacts of Land Development: Employment, Housing, and Property Values. The Urban Institut, Washington, D.C.

again following the relationships indicated in the DEIS. Obviously, these results suggest an alarming underestimation of potential social and economic impacts.[1]

Other sources of information on workforce requirements related to marine terminal and storage construction suggest a higher level than indicated by the DEIS. An ERDA prepared typology of energy projects indicates a peak force construction of 1,250, which is 2.8 times the peak force level shown for the first 4 month of construction in the DEIS.[2] The New England River Basin

CONT 43

Commission Project determined that the average construction workforce for marine terminals is 400 extending over a two year period. The figures are based on construction of facilities with storage capacity of one million barrels as opposed to six million barrels proposed in the initial phase of the NTPS project. Even so, the workforce is about one and a half times the level reported in the DEIS on average.

Recognizing that computation of employment and population estimates is very complex, and that the results reached from the comparative evaluation above must be considered tentative, the construction related population as shown in the DEIS is likely to understate the actual construction-related population by approximately one half.

44

The DEIS does not consider induced energy-related industry construction employment and population impacts. In fact, it asserts that additional

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1/ For a discussion of the problem of underestimation of energy-related impacts on a number of communities refer to Rapid Growth From Energy Projects, HUD, 1979. ppl 6-9.

2/ See Managing the Socioeconomic Impacts of Energy Development, Energy Research Development Administration, September 1977.

3/ See Onshore Facilities Related to Offshore Oil and Gas Development: Estimates for New England, NER BC - RALI Project, November 1976, page 4.125.

petroleum industry is unlikely. However, no documented rationale is provided.

Energy facility development is characterized by phased development and full scale development is not always realized until the completion of early phases. The discussion on refineries contained in the Onshore Impacts of OCS Oil and Gas Development Source Book, prepared by the Conservation Foundation lays out the principal factors influencing industry's decision to develop new refineries. They include:

(a) Nature of Market
(b) Source of Crude
(c) Production Rates
(d) Land and Water Availability
(e) Environmental Regulations
(f) Public Opinion

An inspection of these factors (the relative weight of any one is unknown) would suggest that Port Angeles might be a prime candidate for refinery development in future. Given the demands for additional refinery capacity on the West Coast, on the basis of the factors cited on the Source Book, the siting characteristics of Port Angeles (assuming positive public response) might be appropriate for refinery development.[1]

According to the ERDA study on Managing the Socioeconomic Impacts of Energy Development,[2] construction employment (peak) related to refinery development ranges from 3,500 - 4,500, with construction time ranging from 2 1/2 to 3 years. Peak population levels might reach levels several times

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1/ Admittedly the discussion is speculative, however, refineries are often constructed near source of crude supply. Hence, the need to consider the possibility seriously. A market study would be required for this.

2/ Op. Cit.

that figure.

Operation Phase Population and Employment Impacts.

Recapitulation

According to the DEIS, operation phase employment and population amounts to 48 personnel and 165 persons, respectively. Total population, including indirect population, amounts to about 300 persons. It is assumed that tanker crews would not reside in Clallam County, even if their ships are based there, since their travel to and from home is at shipowner's expense. Provisioning and expenditures by ships crews are expected to result in the creation of about 40 jobs.

Evaluation

45

There is insufficient detail concerning methods for estimating population impacts. The reader cannot ascertain the validity of the estimates produced by the DEIS without backup information on methodology.

Direct employment appears to be understated by the DEIS. In part, this may result from the interpretation of that employment component used by the DEIS. Apparently only company employees are included in the DEIS definition of direct employment. Conceptually direct employment includes all personnel assigned to the project, including company employees, contract employees

CONT 45

(operations and maintenance), and security and fire protection personnel wh are assigned to project facilities.

Contract maintenance crews, personnel who will man the fire and oil spil boats and fire truck, as well as private security personnel should be inclu in the definition of direct employment. This is important because income spe by direct employees in the community will generate demand for indirect or serv employment. By not considering a substantial number of direct employees, fore-casted population associated with the project will be understated.

Direct induced employment is yet another component of project related em-ment that must be considered. Additional personnel hired as harbor and chann pilots, clean up crews (as might be stationed in the area by Clean Sound Coope-tive), tug and barge crews, and bunker oil handlers are classified as direct induced employees. They form part of basic (export oriented) industry employm and thus generate indirect or service employment.

Indirect employment, of course includes service workers, wholesalers, retai public servants, etc. Jobs in this category are generated as a result of expe-ditures by direct employees.

The DEIS assumes that none of the tanker crews will reside in the Port An area. However, no documentation is provided in support of this assumption.[1] Given the natural amenities of the Port Angeles area it would seem likely tha some of the crews would establish residence there. A reasonable means of asses-ing the residential location preference of tanker crews is available, however. Tanker crews presently making the run between Valdez, Alaska and Cherry Point, Washington would likely exhibit similar location preferences to those who woul make the run between Valdez and Port Angeles. The ARCO Company undoubtedly ca supply the necessary information.

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1/ The NTPC Application makes the assumption that 27 crewmen will elect to reside in the area.

46

Income

The discussion on construction and operation phase income is incomplete. It should include a comparison of per capita and household income for the impacte areas' population against the income of the in-migrating population. Further it should break out the amount of income spent by commuting employees in the Port Angeles area. Expenditures on housing (both rental and owner-occupied) are functionally related to household income and marital status. Hence, income data organized by type of household (single, married) is needed to estimate housing demand.

The DEIS correctly indicates that construction workers would have higher purchasing power than existing Clallam County residents. The effect of this, as indicated, will be to drive up prices, especially housing prices. The DEIS suggests that housing prices might increase 20 to 25 percent. This appears conservative. The experience in Alaska, and Kitsap County, Washington suggests tha prices might rise to much higher levels. In addition, the DEIS concludes that the increase of prices would be temporary only. However, this may not be so, a prices of housing, especially, tend to stick upward. In Clallam County, with a historical rental housing shortage, the likelihood of this occurring is quite high. Only if considerable overbuilding were to occur would prices, held temporarily high during construction phase of the NTPC facility, tend to come down.

The DEIS discussion should specifically identify the number of low income persons who might be displaced or adversely affected as a result of the constructio and operation of the NTPS.

The DEIS does not consider induced development impacts, such as the introduction of refinery capacity to the area. Given the number of construction and operational personnel and related population of such development, the income impacts on the community would be far reaching (as would other socio-economic impacts). This should be considered, unless it can be adequately documented that there is a low probability of induced energy related development.

47

Housing

The DEIS states that single households would share accomodations. It does not, however, incorpate sharing by unrelated individuals into the housing demand analysis. According to the 1976 Annual Housing Survey, U.S. Census, for the Western Region, about one half of single persons share rental housing. Thus, 126 CONT housing demand would be reduced as a result of sharing. Transient housing however, including hotel/motel rooms and rooms for rent would probably show a lower ratio of sharing.

47 Naturally if the employment levels associated with the NTPS have been incorrectly estimated, as seems likely, the housing impacts evaluation would suffer, because employment and housing are closely interlinked. Similarly, the impacts on housing in the community could be exacerbated by induced energy-related developments which is not considered by the DEIS.

48 Schools

The DEIS does not provide the basis for estimating the school enrollment associated with the NTPC facility. The spacial distribution of the student population is not adequately supported with information concerning housing supply, potentially residential preference of in-migrants, or by land use policies and plans.

Aside from additional enrollment, and spacial distribution of the student population, there are a number of school impact issues which should be addressed. The capacity of school facilities should be indicated by year (for the years during which the impacts occur). These measures should reflect acceptable state standards. Since school districts are independent financial entities, the financial mechanism for funding capital improvements (including ratio of expected state support for construction) and maintenance and operation expenditures should be discussed. The fiscal impact on schools is generally related to the existence of physical capacity, per pupil costs borne by the local jurisdiction, additional revenue base associated with the new population, and local bonding capacity to facilitate construction if required. To adequately assess the impact of development on schools is a fairly complex undertaking, which requires considerable elaboration, far more than that provided by the DEIS.

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Underestimation of employment, and hence population, might result in a serious underestimate of school impacts.

49 Medical Facilities

The discussion is inadequate. Information should be developed on expected user rates by type of illness or injury. Evidence should be provided indicating the capability of the existing facilities, especially emergency capabilities, to handle specific problems, or crises.

Construction related employment can be expected to impact facilities which handle alcohol problems. There are applicable State standards for alcohol prevention and care facilities which should be considered.

Impacts on medical care finance should also be addressed. Again, higher employment levels associated with induced energy development would significantly increase impacts on medical facilities.

50 Police

The DEIS states correctly that police services would be adversely impacted by the NTPS development, however, it does not indicate the degree to which this would happen. Analyses of communities which undergo rapid growth indicate that real per capita police expenditures rise at a faster rate than the rate of population growth. The impact assessment of the NTPC project should take this growth phenomenon into account.

Additional population associated with induced development and any upward revision of employment would adversely impact police services.

51 Fire Protection

The DEIS attention to this important public service is extremely inadequate. An analysis of need should be conducted based upon state-of-the-art knowledge on fire protection requirements and fire fighting capabilities. Such information should be compared against an in depth examination of existing resources, such as manpower, equipment, facilities locations, and response times. The impact analysis should also consider the financial mechanism and capacity of the independent fire districts and municipalities to provide the needed level of service.

The DEIS should also indicate whether the fire protection equipment to be provided by NTPC will be turned over to the communities or operated by the company or its contractors. If the fire boat were to be turned over to Port Angeles Fire Department, presumably it might be called into service on a mission independent of the marine terminal, thereby leaving it exposed. Such an eventuality should be considered as part of assessing fire protection impacts.

CONT 51 Indirect energy-related development, such as an oil refinery, would result in major fire protection impacts which have not been considered by the DEIS.

52 Community Services

The DEIS asserts that demands for mental health counseling, child abuse counseling and alcohol counseling would increase in proportion to the increase in county population. This is not substantiated. On the contrary, per capita outlays associated with some community services are likely to rise at a faster rate than population growth due to: 1) the characteristics of the in-migrant population, i.e., transient, large proportion single male; and 2) the social tensions brought about by the presence of a large construction worker population competing with members of the existing population for scarce community resources.

Social and Economic Conditions-Pipeline (Subsection 3.2.15, pages 3-119 through 3-126)

The general economic methodology for assessing employment and population impacts for the pipeline is the same as for the marine terminal and storage facilities and as such has been evaluted above on pages 24 through 32.

53 Public Services and Fiscal Capacity.

The DEIS does not spell out the additional level of public services, including fire protection, police, medical facilities, community services, or transportation, which would be required during the construction and operation of the NTPC pipeline. The impact evaluation should compare existing service levels against demands placed upon the systems by the NTPS. Such a comparative analysis would enable the reader to assess any potential adverse impacts on public services provided by communities along the pipeline route.

54 Table 3.2.15-16 Major Tax Revenues Initial Construction Phase indicates sales tax revenues of $689 thousand for Clallam County or .59 percent of the value of construction ($117.5 million). The legal tax rate is .5 percent, hence this figure is overstated. In addition, as mentioned on page 17 above, not all sales taxes related to project construction are allocable to Clallam County, because sales tax distributions are made on the basis of point of sale, (within State) not point of delivery.

55 4. Mitigating Measures

Comment/Additional Information Required

- Under subsection 4.2 Air Quality (Page 4-2), the required use of lower sulfur bunker fuel should be incorporated as a mitigation measure.

- Under subsection 4.7 Marine Resources (page 4-3) the DEIS provides a list of mitigation measures committed to by applicant. Measure number 2, regarding the applicant's membership in the Clean Sound Cooperative, should be expanded to provide for a commitment on the part of NTPC to ensure that equipment is strategically placed to ensure rapid deployment in the event of an oil spill. Measure number 3, provides for a recovery vessel. The type and capability of equipment on board should be identified in order to determine the effectiveness of the recovery vessel.

- Under subsection 4.15 Social and Economic Conditions (pages 4-8 through 4-10), the DEIS notes the NTPC's commitment to develop plans for meeting labor and housing demands associated with the construction phase, after permits have been granted. Because of the potential heavy impact on housing in the Port Angeles area, a housing plan developed with the advice and assistance of local planning authorities should be undertaken at the earliest possible date, possibly as a condition of permit approval.

The DEIS should include as a mitigating measure the provision for fire protection for the terminal and storage facilities based on state-of-the-art systems.

The DEIS should include as a mitigating measure a plan for alleviating transportation problems brought about by construction activity. The plan should incorporate accepted (between affected communities and NTPC) alternative construction traffic routes, changes in traffic flow systems, such as signalization, and car pooling or mass transit strategies.

The NTPC should be committed to providing resources to the impacted communities in order to independently evaluate the fiscal impacts of the proposed facilities. Such impact evaluation should consider both short-term (front end impacts) and long term impacts.

CONT If it is determined that the NTPC proposal will produce adverse fiscal impacts on communities in Clallam County, then the Company should be held responsible for providing financial resources to offset those impacts. This should be done either through pre-payment of local taxes or administration of grants to affected jurisdictions, as warranted. Similarly, where it is determined the NTPC facilities will adversely impact private facilities, the company should be held responsible for ameliorating those impacts through negotiated settlement.

5. Unavoidable Adverse Impacts. [Any probable adverse environmental effects which cannot be avoided (such as water or air pollution, undesirable land use patterns, damage to life systems, urban congestion, threats to health or other consequences adverse to the environmental goals set out in section 101 (b) of the Act)]

Comment/Additional Information Needed

Refer to sections 3 and 4 for comments on adverse impacts and mitigation measures.

6. Short-Term Uses Versus Long-Term Productivity [The relationship between local short-term uses of marine environment and the maintenance and enhancement of long-term productivity]

Comment/Additional Information Needed

56 Under 6.1 Port and Onshore Storage Facilities (page 6-1 and 6-2) the DEIS asserts that Port Angeles is not economically condusive to development of refineries or petrochemical plants. This assertion appears unfounded. The criteria for development of petroleum based industry based on the Onshore Impacts of OCS Oil and Gas Development Source Book have been addressed above on page 31. An inspection of these criteria would suggest, on the contrary, that Port Angeles might be an economically attractive location for energy-related industrial development. In the event of induced development of petroleum related industries in the Port Angeles area short-term and long-term changes would occur on a massive scale.

The DEIS does not consider socio-economic implications associated with short-term uses versus long-term productivity. The fiscal impacts of large scale developments on communities should be differentiated between short-term and long-term affects. Generally, in the short-term fiscal impacts are heaviest due to front-end capital costs associated with accommodating development.

Another short-term versus long-term economic issue concerns the possible decline in activity of existing industries (forest product and recreation) due to the increase of adverse environmental impacts associated with the proposed oil port. Forest products industries may be forced to limit capital expansion or even contract their operations because of competitive cost considerations associated with meeting air pollution standards under air quality conditions which have been made worse by the oil port activity. Layoff of manpower could result with serious implications to, the financial and social health of the Port Angeles community.

Electrical energy requirements of the NTPS are massive. According to the DEIS, 5 percent of Bonneville Power Administration capacity will be required for the pipeline system. Given existing shortage and rising energy costs, the addition of a non-interruptable energy consumer on the scale envisioned by the NTPS proposal will contribute to increased energy prices in the Northwest.

7. Irreversible and Irretrievable Commitment of Resources [Any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented]

57 Comment/Additional Information Needed

The DEIS should emphasize the likelihood of a substantial change in the industrial patterns of development in the Port Angeles area. In the future energy related manufacturing could become the dominant industry.

CONT 57 Under section 7.11 Social Economic Conditions the DEIS presents a comparison of energy delivered versus energy consumed. While the ratio of energy delivered to energy consumed is large, the point should be emphasized that electric energy required to transport oil clearly competes with other demands for Northwest electric power. As a by-product of being an oil conduit to other regions, the Northwest will be forced to export its relatively inexpensive power.

8. Alternatives to the Proposed Action. [Alternatives to the proposed action, including where relevant, those not within the existing authority of the responsible agency]

Comment/Additional Information Needed

- 58 Under subsection 8.1, Introduction (page 8-2), the DEIS states that exchanges with Canada and Japan would not relieve the Alaskan crude oil surplus. The assertion is incorrect. Consideration of such an alternative, in part for that purpose, is currently being given at the highest political levels.

- Under subsection 8.4.1.5 Low Point – Social and Economic Conditions (pages 8-44 and 8-45), the workforce and population estimates for the Low Point alternative as reported in the DEIS, appear to be to low – for the reasons similar to those outlined in the critical evaluation of the proposal (see pages 25 through 32 above).

- 59 Under subsection 8.4.2.1 Cross Puget Sound – Land Use (page 8-56), the DEIS does not consider the land use impacts of the likely change in the materials storage yard, now proposed to be located at Discovery Bay, to a point closer to Green Point and Port Williams. Furthermore, the DEIS does not consider the land use impact of the possible development of a pipe coating yard. A pipe coating yard typically requires 100 to 150 acres of land on the waterfront and a large warf or pier facility.1/ Such a facility would undoubtedly conflict with the Clallam County Shorelines Management Plan.

- 60 Under subsection 8.4.2.1 Cross Puget Sound-Social and Economic Conditions (page 8-57), the DEIS provides no specific information on additional employment and population required under the Cross Sound proposal. Indeed, the increase of manpower and related population required during construction would be substantial. Labor requirements for construction of the marine pipeline would be about 300 workers (assuming one lay barge).2/ A pipe coating yard would require 100 to 200 workers.3/

An increase of workers associated with the Cross Sound alternative would result in increased pressures on existing housing and public services resources in the Port Angeles area.

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1/ Onshore Impacts-Source Book, Op. Cit.

2/ Ibid

3/ Ibid

APPENDIX B

AN EVALUATION
of
TECHINCAL DOCUMENT CHAPTERS 2 & 3
NORTHERN TIER PIPELINE
ENVIRONMENTAL STATEMENT

SUBMITTED TO UNITED STATES
BUREAU OF LAND MANAGEMENT

BY

SCIENCE APPLICATION INC.

TECHNICAL DATA USED BY BLM FOR

ENVIRONMENTAL STATEMENT CRUDE OIL
TRANSPORTATION SYSTEM

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CONT

### Evaluation of Technical Document Chapter

The evaluation of chapters 2 & 3 of the Northern Tier Pipeline System Environmental Statement, submitted to the U. S. Bureau of Land Management by Science Applications, Inc. was done prior to an evaluation of the Technical Document, Chapter 3, Air Quality Impacts. Since the Chapters 2 & 3 are what would be normally read it is felt that the evaluation should stand. The evaluation of the Technical Document answers some of the questions but the main objections remain. Further evaluation reveals numerous other serious deficiencies. (P.) refers to pages referenced in the initial chapter 3 evaluation on which there were questions.

Examples of somewhat answered questions are as follows a better, though in no way complete, description of the terrain modeling and applicability of the Valley model (P. 9). The % Sulfur and the % of ships with segregated ballast used for the report, though inaptly, are answered as is the assumed % of foreign crude oil (P. 13). There was a question of what a 725,000 DWT (P. 21) was. It would appear [illegible] greater than [illegible] DWT. An explanation of why baseline wasn't [illegible] for [illegible] figures (P. [illegible]) was given by the fact that all ship emissions were calculated and considered [illegible] increments. The strange patterns of dispersion (P. 31) are explained through analysis of model input and, as later discussion will indicate, pinpoint invalid results. The given tons of hydrocarbons for the unloading facilities (P. 43) are shown to be totally inaccurate and will be discussed later. And finally the assumptions for and description of [illegible] facility are dealt with.

### ANALYSIS OF THE TECHNICAL DOCUMENT

Generally speaking about the models, any results from a model without terrain modeling ([illegible] & TEM) should be totally disqualified as having validity. These two models [illegible] for a majority of analysis, excluding photochemical analysis. The shoreline bluffs are 100-300 feet and cannot be ignored as is indicated of page 3, "Terrain South of Port Angeles is Complex. . ." This is true but leaves out the bluffs and the valleys which personal observation would indicate are major pollutant transport systems. Studies such as "Observational Studies of Atmospheric Diffusion Processes Over Irregular Terrain" by Douglas [illegible] (Presentation at 69th Annual Air Pollution Control Association Meeting) indicate very different air flow behavior over a mountain valley, over a long two dimensional ridge, and over a riverbed. It points out that flat terrain modeling and then inserting the topography is also insufficient. The very "site specific" topography (including valleys) must be used to model the dynamic air flow. The examples given point to this fact. The only model used with terrain modeling was the Valley and it showed a 24 hour maximum for $SO_2$ of 631 μg/m³ [illegible] (P. 3[illegible]). [illegible] it is clear that violations [illegible] expected frequent occurrences.

Compare this with [illegible] value of [illegible] μg/m³ (P. 1[illegible]) for a three hour maximum and a Window value for a three hour maximum of 345 μg/m³ (P. 1[illegible]). It should be kept in mind that the 24 hour value should be expected to be much lower than a three hour value. A note on the TEM: in one place the maximum total (Project & [illegible]) [illegible] 20 μg/m³ (P. 1[illegible]) and then [illegible] μg/m³ [illegible] (P. 1[illegible]). It should be noted that these expected maximum [illegible] values [illegible] on page 2[illegible] (53 μg/m³) Chapter II of this same report. These figures are absurd [illegible]. Another item about the TEM: "The model is relatively insensitive to mixing height variations" (P. 133). Then why use it in an area where mixing [illegible] of prime importance because of terrain? This in itself is enough to invalidate any results from this model. The [illegible] & [illegible] may be adequate for flat terrain modeling as found in the plains of Texas where these models were developed, but are totally inadequate for the complex terrain surrounding Port Angeles. It is interesting to note that this report says, "whether or not this is an actual (631 μg/m³) violation depends upon the probability of occurrence of this event." No further discussion is given as to the expected frequency. Also note the predominance of pictorials and tables representing non-terrain modeling and the confusing presentation of the valley printout without explanation (P. 159). It is felt what is not said, the presentation, and the emphasis show the bias of this report.

Further comments on the Window values are that they (631 μg/m³ $SO_2$) are only plotted for the [illegible] direction and becomes a considerably less value ([illegible] μg/m³ [illegible]) [illegible] be a violation [illegible] just the wind frequency in this direction to figure probabilities of violation. This value was only [illegible]. [illegible] to have a [illegible], Window [illegible] is used for input for other modeling [illegible] of worst case conditions. The only directions looked at are [illegible] on page 1[illegible] ([illegible]). It should be noted that in the [illegible] (P.1[illegible]) of the probabilities versus relative concentrations that at no distance in the worst case or at the 5th percentile (near worst case) is the wind from any of these direction listed above. Now note that for worst [illegible] at 2 km. [illegible] Window (P. 125) is $1.93^{-6}$. [illegible] percent of the wind directions [illegible] of $1.58^{-6}$ or above. This should indicate the fallacy [illegible] for worst case conditions as input to other models as [illegible] probabilities would probably be underestimated (if $1.93^{-6}$ were a violation, it is very possible that $1.7[illegible]^{-6}$ would also be, but not be included in probability estimates because it isn't a worst case wind direction). Couple this to the fact that the Window doesn't terrain model (even poorly as the Valley) and it can be concluded that the indications of frequencies, relative concentrations, and worst case wind directions are probably invalid. Now to use this as input the only terrain model invalidates its findings (probably as to frequency of violation, PSD and standards and as to distance and direction and possible concentrations.)

The Valley model does not provide a rigorous mathematical description of the physical circumstances which pertain to flow about terrain features. (P. 173) This is a serious deficiency in areas of rugged terrain as found at Port Angeles. The selective use of wind directions from the window for input to the TEM can be easily seen in the strangely patterned isopleths of concentrations. Especially graphic is the [illegible] plots on P. 156 showing the effects of the invalid input. These unnatural patterns were questioned upon review of Chapter III and this analysis indicates the reason is erroneous input. GIGO is a term used by persons familiar with computer usage. It stands for garbage in, garbage out.

The other item on the models is again on the Window model, which in turn is used as input to other models. The data listed on tables 3.3-9, 3.3-11, 3.3-13, 3.3-15 for concentrations at 8 and 12 km. say they are for Low Point not Port Angeles. This is the data this report uses for further analysis.

This general [illegible] should show this report to be useless except for a [illegible] gathering of data. Following are a few more precise criticisms.

Let us look at the queing model used. (P. 137) It is invalid and misleading. For a two berth facility we are told that both horizontal and vertical axis are represented by the two berths. What this does is to limit the analysis to two ships in the harbor at a time. Both a poison distribution [illegible] and a binomial distribution [illegible] agree that the probability of 3 or more ships in the harbor is .083 or 30.4 days a year (one month). For a three berth facility of 1.2 MBPD the probability of 4 or more ships in the harbor at once is .0532 or 19½ days a year. It should be noted that at this maximum throughput (1.2 MBPD) once a year we could expect six ships in the harbor at once if we presume random variables as suggested. Coupled with probability distribution of normal shipping these are critical values for worst case emission analysis and risk analysis. With this misleading queing analysis, it can be clearly seen that this report underestimates worst case conditions and expected values and frequencies of PSD violations. It should also be mentioned that these queing probabilities are based on the assumption that arrival rate is an independent variable. This fact is a note but it is stated (P. 1[illegible]) "Any potential constraints (i.e. non-random variables) would have negligible effect on the results, i.e., the simulation results are probably [illegible] as the estimated data on ship traffic." If this is the case then neither have any reliability. If the variables are non-random, the distribution predictions can be expected to be considerably off. Normally occurring items like strikes in one port or another, shut down for maintenance of shipping facilities, weather, seasonal variations and of prime importance, economics are examples [illegible]. If it would be beneficial to have a small inventory [illegible] then we can expect bunching (more ships in the [illegible]). The fact that we are not dealing with [illegible] also affects results. As ships stack up, future days can expect increased probability of increased numbers of ships in the harbor. The dispersion analysis would be accurate if ship times in harbor were not overlapping because of limitations of port facilities and numerous ships being in port more than 24 hours. For all worst case and PSD the incorrect shipping queing probabilities (i.e. not considering 3, 4, or 5 ships for worst case) lead to incorrect conclusions. This is also true for annual concentrations. TEM (P. 131) uses $C_T = \sum_{i=1}^{n} C_i f_i$ with $C_T$ = total annual concentrations, $C_i$ = concentration of ith scenario & $f_i$ = probability of ith scenario. If $f_i$ is incorrect it can be seen that $C_T$ is also incorrect.

This report says that several sources concur that $SO_2$ emissions can be calculated in LB/[illegible] of fuel burned = 6.7 x % Sulfur Fuel (#6) is assumed to be [illegible] LB/Gal. Turner's Workbook of Atmospheric Dispersion Estimates, P. 65, shows that emissions could be calculated LB of $SO_2$/LB fuel = [illegible] x % sulfur. "Useful Tables" Babcock & Wilcox take into account for oil firing and give it as [illegible] for oil firing. For 2% Sulfur fuel this [illegible] if we assume [illegible] LB/Gal which corresponds well with SAI's presentation. [illegible] is all based on an assumed value for Bunker C (#6) fuel of [illegible] LB/Gal. As the density rises so does the LBs of Sulfur from the calculations because the figures are in LB/LB and must be converted to LB/Gal. Table 35, P. [illegible] of AP-40 lists a typical value for #6 fuel oil at 8.33 LB/Gal (with 1.[illegible] S) & Table 146 P. 539 of AP-40 indicates a value of 8.44 for a typical value [illegible]. Also, Babcock & Wilcox list the range (P. 3-19) as [illegible] LB/Gal to 8.61 LB/Gal. With the examples given it can be seen that [illegible] not conservative and not even a typical expected value and any rate should definitely not be used for worst case analysis. In fact "Combustion Reference Handbook" by York Research indicates that Bunker C fuel is one class lower (heavier) than #6 residual oil. This can especially be expected as the price of oil rises and the lighter more profitable "lights" are extracted with more efficiency as is already the case with the Asphalt Quality. This may appear minor but amounts to 3-5% increase in $SO_2$ emissions values like these are crucial in an area that is at or near non-attainment for $SO_2$.

On page 20, this report says "The applicant will require that tankers fire fuel oil with a sulfur content of 2% or less. And how will they do this? They are not a regulatory agency. Will they attempt to dictate in cases of interstate and international trade? It should be remembered that Washington State was unable to regulate tanker size. To quote the Federal Energy News, "An executive summary of an analysis of the alternatives available for the transportation and disposession of Alaskan North Slope crude oil," Nov. 30, 1976; "Because permit conditions legally binding only on the facility owner or operator might present enforcement problems, it is likely that many of the emissions restrictions would be imposed on tankers through state implementations plan revisions." There have been no indications of state revisions at this time. It would be difficult to legally bind the ships. As they are only users of the facility, any attempts at restriction by the company could be challenged under interference of interstate and international trade. The presumption of the use of less than 2% fuel is unwarranted at this time.

In the following discussion of hydrocarbons, note that there are Federal guidelines, [illegible] State standards, Puget Sound APCA standards, and Northwest [illegible] standards. Guidelines are not to be ignored nor are state standards just [illegible] regulations. These standards are not tied directly to oxidant standards. Attempting to show no violations for $O_3$ does not free one from the obligations of obeying the law for hydrocarbons. In Chapter III ballasting emissions are totally ignored. These in themselves would be in excess of [illegible] a year and spread in such a manner to represent emissions far more severe than is indicated. These emissions would cause violations far in excess of legal limits and could be expected frequently. The tank farm would also cause violations. This fact is mentioned in an earlier Northern Tier siting application as a worst case. Now it seems to be ignored. WHY? We are not given 3 hours expected concentrations, frequency of violations, [illegible] plots for [illegible] values of HC or anything else concerning impacts or concentrations. In the Tech. Doc. III we are given some HC values for ballasting (used in $O_3$ modeling) and for the tank farm but we are given no expected concentrations.

Page 2[illegible] indicates 4[illegible] LB/HR for a 190,000 DWT ship ballasting 20%. This [illegible] derived from P. [illegible] which shows [illegible] LB/event for this size ship and dividing by 1[illegible] HRS. This is incorrect as this is the unloading time. The ballasting [illegible] explained on page 30. [illegible] LB/HR for the correct value of 3.0 Hrs for ballasting. [illegible] by a factor of [illegible]. Using Turner's Handbook [illegible] massive violations. Any ship ballasting will result in violations. [illegible] shows interesting facts. Even with segregated ballast many ships do not [illegible] the needed [illegible] ballast to get out of the harbor in good weather and much higher percentages in bad weather. For example, the 71% of the 300-327,000 [illegible] ships that [illegible] segregated ballast have only the capacity of 1[illegible]. This [illegible] that [illegible] ballasting will occur on the best of conditions. Turner's Handbook [illegible] this ballasting will result in hydrocarbon violations.

An example: For [illegible] DWT ballasting 20%

$\chi(x,y,0;H) = \frac{Q}{2\pi\sigma_y\sigma_z\mu}\left\{\exp\left[-\frac{1}{2}\left(\frac{z-H}{\sigma_z}\right)^2\right] + \exp\left[-\frac{1}{2}\left(\frac{z+H}{\sigma_z}\right)^2\right]\right\}\exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right]$

[illegible] $m^{-3}$; Q = emission [illegible] g/s, μ = [illegible] average wind = 4.29m/s. H = [illegible] effective height; z = ground level height (m); x = downwind [illegible] (km); y is distance from plume centerline; $\sigma_y$ & $\sigma_z$ are wind deviations [illegible] obtained from Figures 3.2 and 3.3 of Turner's Handbook. Assume x = 1.2 km downwind; 4.29m/s average wind (actually too high, but what this report uses); stability C; ground level = 0; H = 0 (not a stack emission). Then χ (x,0,0,0) = $\frac{Q}{\pi\sigma_y\sigma_z\mu}$ = .002623 $gm^{-3}$ or 2623 μg/m³. For a [illegible] averaging period, if we change to 3 hours, we have 2623 [illegible] = 1[illegible]71 μg/m³. The standard is 160 μg/m³ or a violations by 9.2 times and this is only for one ship and only using ballasting emissions.

It could also be pointed out that EPA's "Alaskan Oil Disposition Study" differs greatly in the amounts of emissions for hydrocarbons from ballasting. For example, the [illegible] listed 13,221 lb/event for ballasting 20% of a 30,000 DWT tanker without segregated ballast. SAI lists it as merely 2635 lb/event. SAI lists 11[illegible] lb/event only for the very largest supertanker.

Using the [illegible] suggested by the EPA (Alaskan Oil Disposition Study) is to treat the ship as a fixed roof tank as detailed in AP-40. This lists the formula $F_{[illegible]}$ = [illegible] = turnover factor = .23 as suggested by EPA. [illegible] if one [illegible] with the methodology used to arrive at this figure (see EPA's Alaskan Oil Disposition Study), it should be noted that Figure 48/ [illegible] shows this is an exponential function with lower limits near .23. [illegible] true vapor [illegible]; V = volume pumped into tank bbl. For example, [illegible],000 DWT x 20% = 38,000 DWT for 42 gal/bbl @ 8.34 lb/gal = 243,005 bls. Therefore, $F_{[illegible]}$ = [illegible] = 230 bls = 52,698 lb x .23 (turnover factor) = [illegible]13 lb/event emission. Compare this to the 6[illegible] lb/event SAI suggests, and we find we would expect a 30% higher value than what is reported. This methodology is for oil. The [illegible] vapor pressures are exceedingly low and [illegible] temperatures too low, as will be discussed later, so these emissions would be low by a factor of three. The given figures show massive violations. For larger ships we could expect a weighted TVP of 5.2 which would give 12,155 lb/event for a 190,000 DWT at 20% ballast. This is 1.83 times the SAI values and in no way assumes worst cases.

Ship venting emissions seem to be totally ignored. Venting is associated with ships without inerting systems and purging with ships with inerting systems. The EPA Alaskan oil disposition study refers to "natural venting". To quote the Federal Energy News previously referred to: "venting emissions can also be produced by the evaporation of oil from the walls and bottom of empty cargo tanks. This process, which begins while the tanker is discharging, continues until the pressure within the emptied tank achieves or approaches an equilibrium with the atmosphere. Tankers with gas-inerting systems would normally prevent the release of this form of venting emissions." Every implication is that you have natural venting if there is no inerting system.

Another important note is from page 3[illegible] of this report: "It is assumed that [illegible] or venting of the tanks are operations that are not carried out in the port area except in emergency situations." About ballasting: "under adverse weather conditions or sea conditions a larger percentage (than 20%) may be necessary in order to leave port safely." To quote the Federal Energy News: "There are no Coast Guard or local requirements for the quantities of ballast [illegible] Coast Guard policy is that the vessel's master [illegible] qualified to determine what ballast his ship will carry, [illegible] requirements for stability and structural integrity." The EPA Oil Disposition Study also states on page 7 that purging is the option of the master of the ship.

Moving on to the tank farm emissions, we find many more problems. First [illegible] discussion of the failings of API 2517 (page [illegible]): "Until that time [illegible], API 2517 represents the only generally accepted methodology." This is followed by the total contradiction of reducing the standing storage

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losses by 40%. The reasoning is based on certain tests by Engineering-Science Inc. on 13 tanks containing petroleum distillates, whose measured hydrocarbon emissions averaged about one-half the estimations by API 2517. It is also stated that in five of the tanks the estimates were underestimates. It is [illegible]able that any technical organization would reduce formulae values by 40% on the basis of tests that show 38.5% of the values were already underestimates. The reason for higher emissions could be suggested by the formula in AP-42 (February 1976), which is indicated to be from API 2517. It is:

$L_s = \frac{2.74\, w K_t}{V_c} D^{1.5} \left(\frac{P}{14.7-P}\right)^{.7} V_w^{.7} K_s K_c K_p$ L_s = storage loss lb/day 10³ gallon capacity. Kt = .045 welded double-seal; D = diameter (if greater or equal to 150, use D√150); $V_w$ = average wind in mi/hr; $K_s$ = seal factor (1.0 for good seals); $K_c$ = .75 for crude oil; $K_p$ = paint factor (.90 for white paint); w = density of liquid at storage conditions, [illegible] lb/gal.

This is equal to the formula listed in AP-40 as used by SAI:

$L_y = K_t\, D^{1.5} \left(\frac{P}{14.7-P}\right)^{.7} V_w^{.7} K_s K_c K_p$ = standing storage loss in bbl/yr

These are equivalent equations only if w is the density of the condensed vapors. This is valid as only lighter hydrocarbons volatilize. However, neither formula (especially that in AP-42) would indicate that this should be done. In fact, because these are emperical formulae and not theoretical, the definition of [illegible] should not be used. However, API 2523 (1969), a later publication than API 2517 (1962), recommends the use of condensed vapors. This could be one reason for Api 2517's overestimates. Since SAI used the density of condensed vapors, SAI probably made an unjustified double correction—39%, by using condensed vapor density and then a 40% reduction on top of that.

Tank farm configuration is ignored. Variations of this item are covered in some length in EPA 910/9-77-044 (Alaskan Oil Disposition). There is considerable variation of concentrations for tanks in line with the wind, across the wind or clustered. The wind could be expected to be north to northwest at this point because of Dungeness Valley starting to open up here. The farm could be viewed basically as two sets of tanks in line with the wind. The configuation of the tankers is also ignored. F112-F117 (EPA Oil Disposition Study) shows a variety a expected relative concentrations for various tank farm and tanker configurations. As example: At .5 km., stability C, wind speed 5m/second, the concentrations expected for an inline formation are 3.7 times that of an across-line configuration of a tank farm. The variation for tankers is 2.6 for the same input. Average g/s emissions from the tank farm are insufficient for worst case analysis. The $V_w$ in the previously given tank farm formulae would be wind speed associated with annual emissions. For worst case analysis, worst case wind velocity must be used in the analysis.

There is indiscriminate use of excessively low reid vapor pressure. This is mentioned in the review of Chapter III also but it cannot be overstressed as it could easily double the estimated hydrocarbon emissions for both tank farm and ballasting. A major point not mentioned is that the Alaskan oil temperature is expected to rise as throughput increases. In "Summary Report--Air Quality for Transalaskan Pipeline System Terminal" (presented to the Alaskan Department of Environmental Conservation by Alyeska in 1974) pages 6-13 say that true vapor pressures for 6, 9, and 12 PSIA are .6, 1.2, and 2 million BPD throughout respectively. Alyeska uses an RVP of 5.4 PSIA, which would indicate temperatures of 98 F, 120 F, and 145 F. At RVP of 4 PSIA, this increases ballasting emissions as previously mentioned by over a factor of two, and for the tank farm it increases estimated emissions by a factor of 2.5. This report is using unrealistically low RVP. If the RVP used by Alyeska were used, we could expect even far greater emission levels.

Another point that has not been addressed is the use of numerous mixers to prevent sedimentation. Numerous inquiries have been made, including to API, as to whether or not the tanks that the emperical formula are based on for tank farm emissions had mixers. There is no indications in AP-40 or AP-42 that they did. If they did not, we could expect much higher emission rate because this constant agitation would be the same as raising the vapor pressure. Following is an example of air quality that might be expected from tank farm emissions. As can be seen, this is using only tank farm emissions not counting existing sources or berthing facilities and SAI figures that have been shown to be low by a factor of probably more than five. Using Turner's Handbook at 700M distance downwind, 1st emissions = 14.12g/s (average summer emissions 1.2M BPD), use wind speed 4.29 m/s; 0 effective stack height and at [redacted] level and at center line at 700M stability B, $\sigma_z$ = 38m, $\sigma_y$ = [illegible] m,

[illegible]

for ten minute averaging; converting to three-hour averaging— [illegible]$(\frac{10}{180})^{.2}$ = 419.8 μg/m³, a violation by a factor of 2.6. Even for [illegible]9,000 BPD with summer emissions of 6.47 gs⁻¹ comes to 193 μg/m³ for the same conditions. It is realized these calculations are very rough and assume flat terrain and ground level emissions. However, this random selection indicates a strong potential problem.

Some other error and/or omissions will be briefly mentioned here, because they have already been brought out in the analysis of Chapter II. The inversion heights are far too high as is indicated by frequency of inversions less than or equal to 500 feet as reported by Koetler; the fact that Holzworth is for upper air inversions, by visual observation and by ITT's temperature soundings. For tank farm emissions, no consideration is given for paint becoming dirty, and for seal deterioration. As emphasized in the critique of Chapter II, the weather of Ediz Hook is not suitable for dispersion modelling when the plume is over the land mass. Other sources are available for weather data on the land mass not Ediz Hook sticking out in the Straits. These conflicting weather values must be used for dispersion calculations with integration being employed. There is also no mention of cyclic weather patterns. Not only must worst case be considered, but worst year conditions. Long periods of weather data (longer than the cycles) must be evaluated and yearly standard deviations established to be used for accurate emission expectations.

Concerning PSD considerations; it has been shown that there will be Class I and Class II violations. This is whether or not the Park Headquarters is considered part of the national park (Class I). If the headquarters are considered Class I, there is no doubt of PSD violations, even if much lower % sulfur fuel was used. On this point SAI (page 4) says: "...April 1978 EPA issued a statement indicating the park headquarters, following the letter of the law, was part of the mandatory Class I region associated with Olympic National Park." So, by the letter of the law, we have violations. If we don't consider the headquarters mandatory Class I ("letter of the law") we still have $SO_2$ Class I PSD violations. SAI then questions "the intent of Congress". The Clean Air Act as amended in 1977. Part C—PSD, Sec. 160: The purpose of this is as follows: "To insure that economic growth will occur in a manner consistant with the preservation of existing clean air resources." The massive increase of hydrocarbons with strong potential for visibility reduction and pollution by secondary hydrocarbon pollutants exists. This is a clear violation of the intent. Taken into account that the Class I PSD increments are very small, the fact sec 165, c, 2, C, ii allows for permit denial even if the project will cause less than PSD Class I incremental increases if adverse impact (including visibility) can be demonstrated by the federal land manager. Since these values are so small, it is clear that minimal adverse impact is also being addressed. The intent of Congress is clear to preserve our pristine beauty found in our national heritages--the National Parks. SAI's approach to visibility is given on page 203: "Another fundamental conceptual problem relating to visibility and the application of visibility to Class I area deals with whether the observer is within the Class I area looking out, outside the Class I area looking in, or inside the area looking across it. None of these details were clarified in the recent Clean Air Act amendments. . ." For purposes of the evaluation in this presentation, it is assumed that the question of visibility is related to an observer located within the Olympic National Park observing other objects contained only within the boundaries of the Park itself. This approach is not acceptable. Over two million visitors visit the Park annually. The Port Angeles to Hurricane Ridge road is the main access road to the Olympic National Park. Two of the three main lookouts on this road are within the Park looking out. The Olympic Peninsula is noted for relatively pristine air. Considering this problem on a park-to-park basis, one would find few if any other national parks where looking out from the Park is of such prime importance, and that the surrounding areas are pristine. Couple the points mentioned above with the stringent restrictions imposed by Congress (also indicated above), it should be clear that Congress would intend no significant deterioration to be permitted of the pristine area, as defined as being in the Park looking out. As will be indicated by comments on photochemical oxidants, this could be a highly significant impact with international implications. Both of these points are very important and have been given only cursory treatment or ignored entirely.

The section of the Clean Air Act quoted insuring economic growth will occur in a manner consistant with the preservation of existing clean air resources also pertains to PSD in Class II areas. The massive introduction into an area relatively pure of hydrocarbons is a clear violation of the Clean Air Act.

One other major topic remains and that is of photochemical oxidants. Since this is such a complex and little understood process in all of its implications, it will be dealt with briefly in terms of model input and lack of comments on actual impact. Formost is the fact that ballast emissions have been grossly underestimated as has been discussed. This is crucial as this report points out the $O_3$ concentrations expected are to some extent dependent on HC to $NO_x$ ratios. These ratios change dramatically using more realistic ballasting creating far greater $O_3$ concentrations. Ozone and light hydrocarbon measurements in Phoenix, Arizona (Westberg, Robinson and Zimmerman), states: ". . . [illegible] be shown that the adverse effects of photochemical smog are strongly related to atmospheric ozone where $O^3$ is not an emission but the results of atmospheric reactions between at least two other pollutants--nitrogen dioxide and some of the more reactive hydrocarbons." As an added complexity, it can also be shown on the basis of laboratory data that the amount of $O_3$ generated by $NO_2$ and the hydrocarbons is not only a function of the concentration of these reactive components but also in the ratio of their concentrations. The levels of $NO_x$ are present and in conjunction o[illegible] the corrected hydrocarbon emissions it is expected that oxidant violations will occur.

Item two involving photochemical oxidants is the presumed $NO_2$ to NO ratio. This is also crucial to $O_3$ generation. The higher the ratio (the more $NO_2$), the higher expected $O_3$ levels for given hydrocarbon levels. Page 241 states $\frac{NO_2}{NO}$ = .02 is used which is the recommended value for urban air. Since 66% of all estimated Clallam County $NO_x$ emissions come from the three main Port Angeles mills this is an invalid assumption.

Strictly using population as the means of distribution of the 100 ton/yr emissions existing now is questionable. It is felt that because of the open area of Clallam County and that Port Angeles is by far the main center of commerce, where people go to work, that stating Port Angeles emissions are only twice the rural emissions is an unfounded and false assumption.

The next objection is the use of the simplified five active species, 15 reactions model (Chem 6) instead of the 14 active species, 39 reactions (Chem 15) photochemical model recommended by EPA. It is misleading to suggest impact is EPA-accepted because both of the above methods are included in impact. Cost seems to be the main concern here. The second equation in both methods seems to indicate quite a difference:

| Model | Reaction Mechanism | Rate Constant ppm/min |
|---|---|---|
| [illegible] CHEM [illegible] | $O + O_2 + M \rightarrow O_3 + M$ | $2. \times 10^{-6}$ |
| CHEM [illegible] | $O + O_2 + M \rightarrow O_3 + M$ | $[illegible] \times 10^{-5}$ |

Two other items will be dealt with briefly. The oil-water seperator is not described sufficiently (both tank farm and at the loading facility) to insure there would not be regular high level emissions. These sources must be used for annual emissions based on emission probabilities and worst case upon high emissions. The same applies for routine oil spills and larger spills should also be evaluated in terms of air quality.

It is also felt that projected emissions should increase with time. Assumptions for reduced emissions due to cleaning auto emissions may be unjustified. From "Ozone and Light Hydrocarbon Measurements in Phoenix, Arizona", cited previously, ". . . it is on this basis (ratio of hydrocarbon to $NO_x$) that these and others have argued that automobile exhaust controls that lowered the emitted hydrocarbons were much less effective in reducing Los Angeles photochemical smog problems because hydrocarbon control was gained at the price of an increase in $NO_2$ emissions."

Why aren't the peroxycyl nitrates even discussed? These are of prime interest in photochemical smog.

Regional weather variations are ignored as insignificant. Sequim gets 30-day less a year than Port Angeles with rain variation, annually, of 1" per two miles going west from Sequim and the weather patterns vary greatly. It is absurd and invalid to ignore these variations.

These items together with the fact that the base line emissions are probably higher than indicated, indicate invalid analysis. Rerunning Chem 15 and other models would indicate $O_3$ violations if correct input were used. It is also significant that no mention of PAN, a major photochemical irritant, is mentioned. It is indicative of this report's approach to dealing with law and not with impact.

As mentioned in the analysis of Chapter III, the total existing major source emission estimates deviate largely between estimators. Further viewing of the computer input indicates that not only are there deviations of total emissions (from EPA/DOE), but on stack heights, diameters, temperatures (by more than 100 F), stack gas velocities and stack gas volume flow.

Here is a further summary of this reports deficiencies:

1. Existing source data is probably invalid.
2. $NO_x$/HC ratios use unfounded assumptions.
3. Allocation of existing emission to population is unrealistic.
4. The probability of more than two and three ships in the harbor is not evaluated.
5. PSD violations are not properly evaluated and the input is based on invalid data.
6. Weather deviation is not evaluated.
7. Estimated ballasting emissions are incorrect and not properly evaluated.
8. Window modelling for 8 and 12 km is for Low Point.
9. Improper (too high) inversion heights are used.
10. TEM and TEA are not adequate for low inversion areas with rugged terrain and their input and output is invalid.
11. The isopleths plotted are unnatural pointing to weaknesses in the input.
12. Tank farm emissions are not evaluated as to concentrations (state standards).
13. The question of visibility reduction is improperly and inadequately assessed.
14. No mention of international considerations are made.
15. The $SO_2$ emissions from the ships are not calculated correctly.
16. No model used seems to use adequate terrain modelling. That is, there are no indicated patterns along the valleys.
17. The weather data is insufficient (it is for Ediz Hook).
18. There is utter confusion between various models predictions of $SO_2$ concentrations.
19. Probabilities are not given in days/year and in not doing so are misleading.
20. All combinations (i.e. numerous wind directions) are not used to determine frequency of potential violations. Probability of worst case is not sufficient as [illegible] μg/m³ less might also be a violation but occur many times more frequently.
21. Ships coming into the harbor is not an independant variable. (stacking up of ships because of full berths begins to stack up probabilities.)
22. Reid vapor pressure used is too low.
23. No consideration is given for increased Alaskan crude oil temperatures as the throughput (Alaskan) increases.
24. Insufficient evaluation is given for each scenario for all time periods governed by various enforcement agency regulations.
25. Tank farm emissions are incorrectly reduced by 40%.
26. Incorrect use of calculating one tanks emissions and multiplying by number of tanks for total emissions.
27. Other tank farm factors (as configuration) are ignored.
28. Emissions only are addressed—what about impacts? This report is supposed to be on impacts but none are mentioned. Below is a very brief list of air impacts that should be addressed:
    a. What would be the expected decrease in allowed harbor expansion and local industrial expansion because of degradation of air quality so that further pollution would not be permitted? What effect would this have on decreased potential tax sources for the county and increased unemployment?
    b. How would the project effect tourist trade because of reduced visibility, air quality, and reputation? (also because of reputations gained because of lack of facilities due to construction)
    c. How would this air quality reduction and reputation effect the retirement industry. It could be substantial as inducement to retire in the Sequim area include advertisements lauding no smog, great visibility, and being the "healthiest place in the world to live."
    d. What would be the health effect. In any area with a large number of retirees this is very important as one can expect aggravation of respiratory problems especially prevalent among older citizens. Attached are some graphs indicating health problems.
    e. What would the air quality effect be on plants? $O_3$ is known to be detrimental to conifers and other sensitive plants. What would be the expected reduction of yield or extent of damage because of $SO_2$. This is an area uniquely suited to agricultural experimentation.

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f. How one views his quality of life is like the difference between fine wines; it is the subtle differences, difficult to quantify, that make all the difference in the world. In Port Angeles some of our quality of life is views. How many less days could we expect to be able to distinguish Mt. Baker, what reduction could we expect in viewing Vancouver Island, how much reduction could we expect in crispness (seeing buildings in Victoria)? How many more days can throat and eye irritation be anticipated.

g. What would be the increased explosive risk? This is also an air quality concern. Inerting systems on ships are used to reduce explosive risk of explosive due to massive concentrations of Hydrocarbons (not vented to protect air quality) in the cargo tanks. The errors in the queing, as pointed out, are very important in this analysis.

h. Where is the listing of health, plant and esthetic damage done by the pollutants at various levels and various combinations of pollutants?

This is an air quality impact statement. Then why aren't the impacts assessed?

Following are some tables from "Air Quality Criteria For Photochemical Oxidants" (HEW). They should show some reasons for concern in air pollution and the charts relating to mowing, because air pollution should be stressed in an area with a large retirement tourism industry. An attempt through local questionnaires should be made to evaluate reputation effects on retirement--tourism industry growth.

Also following are other graphs relating to weather and air pollution effects on plants and or animals.

Evaluation of Statement components for Chapters 2 and 3 of the Northern Tier Pipeline System Environmental Statement, submitted to the U.S. Bureau of Land Management by Science Application, Inc.

These Chapters deal with existing climate and air quality, and projected air quality impacts. Pages in refference will be listed on the left with brief comments about some statement on that page following.

CHAPTER 2

P.4: Average windspeed of 9.4 is misleading. This is a value for Ediz Hook. This is ok for partial tanker dispersion but not at all for land related dispersion. The Climatological Handbook of Columbia Basin States shows that a station in downtown Port Angeles had a four (4) year average wind velocity of 8.2 MPH. That site specific data for the tank farm is needed is emphasized by the fact that Sequim 16 miles east of Port Angeles only 65% the rain of Port Angeles. The Washington Marine Atlas shows variation of wind direction and speed between Port Angeles, Green Point and Dungeness Hook. For a proper dispersion model these various wind speeds and directions must be integrated. Using the wind speed from Ediz Hook will lead to erroneously high values of dispersion and low values of expected pollutant concentrations. This erroneous approach is the one taken in this study.

P.6: "Normally, for ground level pollutant sources, the mixing height is of lesser importance." This is not true in this case because of very low inversion heights and terrain, which rises very steeply. This again points to this reports erroneous generalized approach, rather than using site specific analysis.

P.7: The wind direction variation between Quillayute and Port Angeles is important for helping analyze patterns that might be expected coming into Port Angeles and directly effecting inversion height and frequency. No mention or analysis is given to this data.

P.9: "Wind flow from Port Angeles toward the park is infrequent during all seasons." This may be true based on Ediz Hook data, but doesn't correspond to reality. On almost a daily basis one can watch ITT's plume suck up Lees Creek and go behind "the foothills". This is not a prevalent pattern, but a common one for several hours at a time. This phenomena is backed by personal observationsand by photographs. A major fact on this page is that neutral stability is most prevalent occuring greater than ten (10) hours per day, 23% of the time. If we have neutral stability below and stable above the conditions would conductive for fummigation and high ground level concentrations. This phenomena, as indicated by plume patterns, is frequently visible. By this report, surface inversions occur 52% of the time. This highly crucial point seems forgotten in Chapter 3 (three) (surface inversions "will tend to maximize the impact of low-level non-buoyant releases ").

P.10: Table 2.1.2-1 shows seasonal and annual mixing heights (bottom of inversion layer) from 600-1500 meters. This seems to contradict the earlier statement "seasonally, base heights vary during the afternoon hours ranging from the surface during the winter to between 2,000 and 2,500 meters in the spring. The table indicates excessive mixing height. Hasler, C.R., 1961 "Low Level Inversion Frequency in the Contiguous United States," monthly weather review. 89(9):319-339 indicates the frequency of low level ≤ 500 feet is approximately 20% in the winter and 15-25% in the summer (occurance of inversions or isothermic conditions). This shows how misleading averages as used on table 2.1.2-1 can be.

P.11&12: Lists 15 days in 5 years with high meteorlogical potential for air pollution. This is extremely misleading. Besides inversions, what parameters are used? With surface inversions 52% of the time this statement seems absurd. Does it mean for extended periods? Also Holzworth uses isopleths for extrapolation which is ok for flat terrain, generallized data and high level inversions. For surface inversions, which are critical for ground level emission and for site specific data, this approach is totally inadequate. Holzworth's estimated data for inversion heights is far too high for observed surface inversions in this area. "Light winds and stable conditions are characteristics for drainage flows from the Olympic Mountains to the south. ....are infrequent and away from Olympic National Parks". This is misleading for three reasons; 1) wind speeds are actually slower than this report indicates (the Climatological Handbook of Columbia Basin States shows a mean speed of 8.2MPH and that for seven months, September - March, the wind speed is less than 3 MPH 31.6% of the time) 2) During daytime slowest wind speeds do not indicate most stable conditions according to Pasquel. 3) Personal observations and photograpic evidence indicate that wind (light with stable conditions) towards the Olympic Mountains is not as infrequent as mentioned previously. It might be pointed out the 15 days in 5 years of high potential is still 3 times a year. If the pollutants were in the area in high concentrations even this extremely low estimate would indicate violations of "one a year" standards.

P.15: The visitor Center should be considered part of the Park. Most people visiting would consider it part of the Park, the usage is the same as informational centers and headquarters within other National Parks and millions of people annually visit this location when visiting the Park. Any and all reasons for promulgating air quality standards and levels for Class I areas also apply fully to the Park headquarters.

P.14: It is interesting to note that Montana, North Dakota, and Idaho have sulfuric acid mist standards. This is not even mentioned in this report, a serious deficiency. Impacts are not limited to those items legislated. This report seems to only concern itself with legal limits, not with overall air quality and impacts. For this reason this report can not be considered an adequate evaluation of air quality impact because it limits its view to legal problems and by doing so severly limits its overview. No mention is made in Chapter II or III of effects of this project. How then, in any sense, can this be considered an impact evaluation?

P.20: What is lacking from this table of existing air quality is of interest. There is no data for $NO_2$. With relatively high $NO_x$ emissions from the mills and the prime role of $NO_x$ in the photochemical smog cycle (and visibility) the data is crucial. What efforts were made to obtain data? If none, then this is an extremely serious deficiency casting doubts on the validity of this report. The values for Port Angeles are: particulate = 72 annual mean, $SO_2$=53 $\mu g/m^3$ annual, 551 $\mu g/m^3$ 24 hr max, 2573 $\mu g/m^3$ 1 hr max. The values for standards shown on page 14 show all of these to be existing violations.

P.21: It is mentioned that the total suspended particulate and $SO_2$ problem areas are relatively small. I would like to note at this time that even relatively small areas (i.e., Port Angeles) are covered under the Clean Air Act provisions.

P.24: Mention is made indicating that 1976 was a drought year and perhaps should not be considered representative. Even though 1976 was a drought year estimations for worst conditions should be made for anticipated years with conditions most conductive for pollution. With yearly weather variations being large, as they are in the area under study, yearly means become much less meaningful.

P.25: Following is a chart for exististing mill emissions in Port Angeles in tons a year:

| Location | Particulate | $SO_2$ | $NO_x$ |
|---|---|---|---|
| Pen Ply | 180 (78) | 0 (79)* | 94 (33) |
| ITT | 349 (181) | 1992 (716) | 888 (1525)* |
| Crown "Z" | 916 (743) | 875 (1066)* | 921 (787) |
| TOTAL | 1445 [2000]** | 2867 [4900]** | 1903 [2000] |

The unbracketed figures are those presented in this report. The ( ) are values given on 7-19-78 by John Rosenc, Control Officer for Olympic Air Pollution Control Authority. They represent only power boilers - not totals! Why are the only partial values higher than this reports totals (Ref. ()* ]? The values in [ ] are in the EPA's "The Alaskan Oil Disposition Study" P.15. These values are higher as would be expected for estimated totals (except $NO_x$ which would appear an error). These figures strongly point to extremely low invalid data being used for this dispersion data study. E.P.A. also indicates mill emissions at 100 ton per year for hydrocarbons.

P.26: This report says O.A.P.C.A. suggested that the need of projections had never existed for this area (Stating the air quality has changed little over the years). The Northern Tier Project has been going for several years. Modeling and limited data indicate $SO_2$ violations and T.S.P. violations. With these in mind, O.A.P.C.A. should substantiate $SO_2$ violations, hydrocarbon bare line data, and establish trends. They also state "no major population increase or new industry...". This shows severe short sightedness and casts doubt upon research into this area by Science Applications. Clallam County is the eleventh fastest growing County in Washington (one of the fastest growing states).

P.29: "Mobile source emissions are assumed to decrease with time due to increasingly stringent automobile standards as outlined by the E.P.A." I suggest that this assumption is very shakey. Studies indicate that without enforced maintenance for pollution control devices that this decreased emissions is a short lived phenomena. I suggest that S.A. Inc. research this data. Both estimations (with and without reductions) should be included.

CHAPTER III "AIR QUALITY IMPACT" SCIENCE APPLICATIONS, INC.

P.2: Construction of the tank farm with 10,800 pounds per day fugitive dust indicates watering will be absolutely essential and have to be closely monitored. If it is another drought year where would the water come from or would Northern Tier hold up construction? All contingencies should be considered.

P.9: The valley model: "accounts for nearby terrain effects." More descritption, explanation and reliability of its use is needed, with its standard deviation.

P.10: Thanker arrival is assumed to be a random variable: this is not totally true as bunching due to labor trouble, mechanical trouble at receiving terminals, and weather conditions are not totally random variables. A three berth unit is stated if the 350,000 BPD option is used. Who gets edged out of the Hook? The idea of mutual use of the Hook goes out the window if the option (mandated by State Law) is used. The basic philosophy of Northern Teir is exemplified by this thought pattern. No where is the basic idea that the 350,000 BPD could be a part of the 933,000 BPD even considered. This is a thinly masked ruse to bring in three berths and then blame it on State Regulations.

P.12: It is stated that there will be infrequent high emission rates of 1400 pounds per hour for $SO_2$ for 933,000 BPD throughout. This could be expected .2% of the time. This is misleading for 10% (50 times more frequent) still has a relative high value of 1000 pounds per hour or 800 pounds per hour 20% of the time. Before I could accept these figures I would desire to know the assumed value of tanker fuel value. This critical factor is never mentioned. This value is for tanker emissions. Nowhere are the emissions given for berthing seals and pumps. If they are they are, they are grouped with tanker emissions based on tanker fuel consuptions. For adequate analysis this distinction is important. The methodology needs greater explanations. What % of ships have segragated ballasting? Is the separated ballasting equal to the needs for inclement weather? What percent will be equipped with inerting systems and will there be simultaneous purging or sequential purging. Much better breakdown is needed. Most tanker emissions are only dependent on mode of operation, number of ships (and equipment on sip), and size of ship. Value and pumping losses would be wind dependent and would need to be calculated separately. It sould be pointed out the assumptions used are needed throughout this report. Other examples, other than mentioned above, would include tank farm configuration, (a major consideration), whether the farm is considered as a single point source and other physical assumed details.

P.13: Tanker size estimation is up to 327,000 DWT. The NTPC has publicly stated that they will use the largest tankers available (500,000 DWT now under construction; larger proposed). Legislation and litigation may yet determine tanker size. The estimations may be inadequate (certainly "worst case" is not utilized here). What is the capacity in barrels of each weight class of ship? What percent of foreign oil is assumed?

P.16: Going back to the chart for $SO_2$ emissions showing only .2% frequency for 1400 pounds per year. However 50% frequency would result in 500 pounds per hour. This equates to 2190 tons a year. This means this source would be close, if not, the largest $SO_2$ source in this area. This is critical as certain areas are already close or in nonattainment levels for $SO_2$. A note on the nonattainment area. EPA's 910/9-77-044 "The Alaskan Oil Disposition Study" P.15 states "the short term local, State and Federal $SO_2$ standards were also exceeded several times in 1975 and the area is classified as non-attainment for $SO_2$."

P.17 The cart shows $NO_x$ levels at 65 pounds per hours 50% of the time. This equates to 284.7 tons a year. Couple worst conditions plus the fact that the mill's emissions are not continuous 24 hours a day, 365 days per year. This is a pollutant which should receive more attention. This is crucial for the photo chemical smog cycle analysis. This report severly underestimates $NO_x$ existing and tends to average out the yearly average unrealistically.

P.18 Gaussian distribution assumes constant emission rates (or random variation). This is not true for bunching of ships as mentioned earlier nor for the mill emissions. This is a generally accepted method, but can lead to fairly large errors.

P.19 Values on this table are unrealistic, for example: ITT's $SO_2$ emission, do not specifically take operating scheduals into account. It might also be noted that E.R.T. list ITT's total $SO_2$ emissions at 2825 tones per year further increasing this emission rate needed for dispersion analysis. Total Crown Z $SO_2$ emissions from this chart is 14.03 gm/sec which equates to 111.398 pounds per hour. This means we need 655 days a year to reach the 875 tons per year listed on page 25 and this is less, by far, than the true value, as indicated. The same applies to the $NO_x$ values. As can be plainly seen all baseline data in this report is far too low and erronious.

P.21: The discription of the model used indicates that the table on P.23 (3.1.3-8 & 3.1.3-9) labled maximum predicted 3 hour and 24 hour concentrations from the WINDOW at Port Angeles is misleading. This is for 5km, not for the maximum reading. (possibly for 5km only in the direction of the Park) It should be pointed out that the value of 282 $\mu g/m^3$ maximum predicted 24 hour concentrations for $SO_2$ would be in violation of state law. Keeping in mind that the S.A.I. baseline estimates are grossly low, and that both wind speed and direction are wrong, we could expect far higher maximums (which probably would not occur at 5 km). Areas currently coping with high $SO_2$ concentrations would in all probability be far closer to the maximum concentration point. A minor point: "...two largest possible ships (7250,000 DWT)..." one wonders what size this ship is. Also on the P.23 table; what is the assumed wind speed? What is the frequency this violation could be expected.

P.24 We could expect class I PSD violations 1.5% of the time. It is more graphic to say 5.5 days a year, and this is for the Park Boundry, not the Park Headquarter. This is based of wind frequency data. As indicated by experience and photo evidence, the frequency of wind toward the Park is far higher than this report illustrates. A closer value for south wind is 2.9% (as opposed to 2.4). Howevers, as the concentrations are underestimated and personal observation that SSE winds should be considered, we could expect violations at least three times as frequently as this study indicates. Because of the large $SO_2$ underestimations a factor of 10 would probably be more realistic. On this page we are quoted a value of 25 $g/m^3$. This should be 25 $\mu g/m^3$. Of prime interest is what is the baseline assumed for the Park Boundry? ? You need this value to calculate PSD values. This section needs clarification. What and where are the maximum concentrations! From the statements it is clear that page 23 does not refer to maximum concentrations (3 hours X/Q is 2.02x10 sec/m and 24 Hour X/Q is $1.11x10^{-6}$ sec/m with the table showing no factor of 10 between 3 hour and 24 hour estimates: perhaps another misprint?). Since the emission rate is for tankers only (179gm/sec equals about 1400lb/hour stated as tanker emissions earlier) these maximum concentrations might be presumed for only tankers and they show violations. I believe the following is what is intended (P. 24). Emissions are for tankers and maximum concentrations are total (baseline and project emissions). If so then all of the projects' emissions are PSD increases. If the normalized 3 hour max X/Q is $2.02x10^{-6}$ sec/m, the concentration corresponding would be $2.02x10^{-6}$ x179gm/sec/3.64m/sec=98.35 $\mu g/m^3$ which is a clear class I violation for 3 hour (8.2 MPH average wind was used). For 24 hours it works out to $1.11x10^{-6}$sec/m 179gm/sec/3.64m/sec=54.09 $\mu g/m^3$, also a clear class I violation. For a Briggs Model, estimates may be expected to be within a factor of three and even more unreliable for extremes of stability. This is using above average windspeed. For lesser winds this value would exceed class two standards. At 1 meter/sec wind we would have 358 $\mu g/m^3$ and 196.9 $\mu g/m^3$ respectively.

P.25: "results indicate that the probability of exceeding the class II PSD increment is a maximum at 8 km. This distance seems far for maximum values. It seems more like distance for secondary pollutants and a qustionable figure. Even so, we have violations 3 days a year - a Federal violation. This is a class II area (Port Angeles. The addition of at least 91 $\mu g/m^3$ is totally unacceptable in an area with $SO_2$ problems (besides being illegal). Only PSD violation is mentioned. There would be state and federal ambient standards also violated. Also the PSD of visability is ignored. $SO_x$ has a primary function in this matter and is an area of utmost concern. Small decreases in visibility, by laboratory standards, would be highly significant because of existing haze.

P.27: With Valley (for complex terrain). "However, any increase in concentration that would occur on the sides of the terrain are ignored. Furthermore, in the case of such plume impingement, Valley cannot predict concentrations on the leeward side of a substantial hill or ridge." This is very interesting as this describes much of the Park boundary. One wonders at the validity, in this respect also, of this reports findings. "Episodes of poor dispersion are identified directly from the Historical Meteorological Data Base." This is invalid as this report uses incorrect wind data and the inversion lid worst case is assumed to be 250m which is far to high as discussed previously. Because of our low inversion height the statement, "the magnitude of the concentrations are relatively independent of mixing height," is false.

P.28: "The federal and state 24 hour particulate standards may be violated as Port Angeles is presently a Non-Attainment Area for particulate." The indication that small increases will be allowed is incorrect. The law says there will be NO increase in Non-Attainment Areas. This is an important point. Valley indicates $SO_2$ P.S.D. violations in the Park. Federal and state 24 hour standards may be violated for $SO_2$ in the Park. These statements are very important. Eventually this report will indicate, directly or indirectly, almost all ambient air quality standards may be violated. As the average wind is lower than is assumed in this report these violations have more probability of occuring. Light inland breezes and topography add to this probability. For 7 months the wind is less than 3 MPH 31.6% of the time. The frequency of fog also indicates frequent stable conditions adding again to the probability of violations.

P.30 This isopleth shows the maximum expected $SO_2$ concentrations at 131 $\mu g/m^3$ with the maximum 1 hour value at 141.8 $\mu g/m^3$. This doesn't correspond with page 54 of the EPA, "Alaskan Oil Disposition Study" (910/9-77-044). It shows 24 violations (1975-76) of the Washington State 1 hour $SO_2$ standard. This value is 1048 $\mu g/m^3$. With this in mind I feel all values on 3.1.3-4 for maximum concentrations are erroneous. Tanker emissions should add considerably to existing levels. At the co-ordinates 9 x 5 there are concentrations of 65.5 $\mu g/m^3$. This is within Park Boundries. Since this is presently a Pristine Class I area this would be a PSD violation in all probability.

P.31: I would like this concentration pattern explained. How could it come about? Why does it (3 hour) vary in location from 1 hour concentrations( the 24 hour pattern goes back to the 1 hour pattern)? Why this 3 hour variation for $SO_2$?

P.32: The 24 hour maximum value on the isopleth is 45.5 $\mu g/m^3$. Why then were there 3 violations (1975-76) of the State 24 hour standard of 260 $\mu g/m^3$? With such a discrepancy, are we ignoring baseline and historic data?

P.34: VALLEY shows higher values than TCM, but who can read them? It is no wonder they do not summarize them so they are readble - they show clear violations - all the charts summarize TCM models which are lesser values and don't take terrain into account - or useless for Port Angeles. But even VALLEY model grossly underestimates because of low baseline estimates and incorrect weather data.

P.36: This table shows existing and combined values for maximum annual average $SO_2$ levels as between 30 and 33 $\mu g/m^3$ (depending on project size). Explain these figures in view that this very report (p.20 Chapter II) states the existing annual $SO_2$ levels at 53 $\mu g/m^3$. These figures indicate the reports estimated mill emissions are far too low and the model is not suitable and other (weather) input data is incorrect.

P. 36: The report states annual average concentrations of 20 $\mu g/m^3$. This would be a humorous conclusion, if it were not that the results are so crucial.

P.37: "... it is assumed that visual range within class I area (the Park) is the key point." This is arguable. Looking out is a major item in this Park and any visibility reduction is severe. Over two million persons visit the Park annually. The Hurricane Lodge is the most frequented area, and on the Ridge Road and in hiking around the lodge visibility looking out from the Park is of prime importance. This issue can not be swept under the carpet with one sentence in a report, it must be evaluated openly and without bias.

P.43: The 350,000 barrel option would need a third berth we are told. This is just a ruse, as mentioned earlier. The worst case analysis standard must apply.

P.45: Reid Vapor Pressure (RVP). The crucial nature of this point has been minimized. If we compare close values of 2.9RVP to 4.0 RVP; 4.0RVP has 138% the emissions (tank farm mostly) as 2.9 RVP in summer with 97°F temperature. Northern Tier insists on using the 2.9 figure. There are indications that it is much higher and world wide values, which are generally far higher and will be approximately half of the project, mean that all tank farm emission estimates in this report will be low by possibly as high a factor of 3* on this point alone. If we use Alyeska's figure of 5.4(RVP) the emissions at 97° would be 196% of that of 2.9RVP. Small wonder that Northern Tier stands alone but vehement in their value - one of the smallest, if not the smallest, RVP figures in the world. If there is an error in methods generally used in calculating, RVP it must be taken into account that the A.P.I. empirical formulae are based on extensive testing. In orther words everyone following the same procedures, even it is might be conductive to higher RVP. According to A.S.T.M. D. 323-72 the test for Reid Vapor Pressure is extremely susceptable to error and that variation of a large magnitude is common between two test Technicians under these conditions, with applied (direct or indirect) pressure from higher management, it would be expected that a lab technician might come up with consistanly low values. Wearing of seals is not considered and should be per A.P.I. (this can raise emissions by a factor of 2 or 3 times). Paint deterioration is not considered. It has an expected value to raise emissions 5% for old paint but may be as high as 15%. As always, the reliability of method is not mentioned. The A.P.I. formulae reliability for tank emissions is ±25%. Also the wind speed is incorrect. All in all these estimates can be considered extremely low.

P.46: Purging and venting will not usually be carried out in Port areas. What controls do we have? How much of the decision is left up to the master of the ship? Also, in this page is the statement that all the oil is assumed to have the vapor density of the Alaskan crude. I feel that in view of the Reid Vapor Pressure controversy that this is a questionable assumption.

P.47: A calculation is made for ballasting. Does this mean that Northern Tier will not have segregated ballasting tanks? If so, what percent segregated and what is the expected frequency for the non-segregated ballasting?

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P.48; The unloading emission will only be 4 tons a year, or so we are told. We need more data on assumptions. Inerting or non-inerting systems or a combination? If a combination, at what ratio? Segregated or non-segregated, or partially segregated (ballasting) or some combinations (some ships with and some without)? What guarantees are there that purging, for ships with inerting systems, will not occur in the harbor? If it, purging, is not done immediately, what are the increased risks of fire and explosion? What assumptions were used for risk analysis? Purging in the harbor causes emissions of hydrocarbons in substantial quantities. If done outside the harbor, we have significant explosion potential on Ediz Hook and if inerting systems aren't used we have large rates of emissions from venting. It is impossible to evaluate this without being told the assumptions used.

P.54; It is interesting that no expected concentrations of hydrocarbons are given, only emission rates. Also, it could be pointed out that a previous Northern Tier siting report estimated emissions at 38.1 pounds per hour rather than the 51.4 pounds per hour (summer) that this report does. At the lower rate the previous report stated we could expect hydrocarbon violations during worst conditions. One must presume that at the higher estimation of this report we would expect even higher violations and have violations expected more frequently. It should be noted both values are without baseline or tanker emissions considered. Other factors previously mentioned (paint, seals, wind, RVP etc.), when considered with the fact that 38.1 pounds per hour would give violations, leads me to believe that 51.4 pounds per hour would result in rather frequent violations. If Northern Tier's earlier values were totally invalid, what is the reliability of these new figures? Following is a very rough spot check with no terrain considerations. For the following conditions: wind = u = 4.29m/s; Class D stability; downwind distance of 700 meter with emissions of 6.48g/sec (51.4 pounds per our); Height of source = 20 meters. Estimates from Turner's Handbook indicate $\sigma_z$ =25 meters and $\sigma_y$ = 40 meters. Using

$$\chi(x,0,0,H) = \frac{Q}{\pi \sigma_z \sigma_y \bar{u}}\,\mathrm{Exp.}\left[-\tfrac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right]$$

$$\chi = \frac{6.48}{\pi(4.29)(25)(40)}\,\mathrm{EXP}\left[-\tfrac{1}{2}\left(\frac{20}{25}\right)^2\right] = 349\ \mu g/m^3 \quad [illegible] = 290\ \mu g/m^3$$

This only for 11 tanks in the summer. Since the standard is less methane (though we aren't told if their calculations include methane or not or their presumed percent of methane if considered) and EPA's estimate is 10% methane we get a value of 261μg/m³ applicable to standards. This is not maximum concentrations for it assumes close to average wind speed, does no terrain modeling, and does not include baseline or tanker emissions. Also, it uses this reports' low emission figures. Since the standard is 160μg/m³ we have a clear indication of violations. Surely this needs more evaluation than this report gives (not even given concentrations). Another point is that the 0600-0900 time limitations on this standard were initiated by a Los Angeles Air Quality Agency, who poineered Air Pollution Control, and reflected the rush hour peaks. With the continuous emissions of a thank farm these time limits become less valid. Antoher assumption in the emission rate is smooth input and output. It also assumed that the number of full tanks and the "stacking up" of tankers in the harbor ar random variables. They are not, and the worst case values would be estimated somewhat higher because they are not.

P.54 "The highest level of $O_3$ predicted is .075 ppm..." The standard is .08 which is extremely close. In light of the continious low predictions of this report, that do not even come to levels of historic findings, we should consider this as another case of potential violation. They say this includes "modest background levels". How are these values derived? And do they adequately give levels that might be byproducts of the mills? .01 seems very low for worst conditions, baseline data. What does Northern Tiers project do that causes .065 ppm emissions while the three mills, traffic and misc. sources contribute only .01 ppm? As the mills produce even more $NO_x$ than the Northern Tier project puts out and the Sequim Valley has more sunny days than any where in Western Washington or Oregon, I do not believe that the use of .01 ppm for baseline can be assumed realistic.

"The chemicl reactions between the oxides of nitrogen and ozone are such that the ozone level is reduced by the presence of other pollutants." This is misleading in that it indicates certain pollution is good as it reduces $O_3$. It can be reduced by hydrocarbons forming pan which is a secondary pollutant with severe respiratory effects, difficult to monitor, but still a health problem. It can be reduced by NO making $NO_2$. In the process it makes more $NO_2$ to react with sunlight to make more photo chemical smog! That it reduces means only that at least the second step of photo chemical pollutants is in progress. Photo chemistry is a dynamic operation, not static that one can apply the simplistic view that there is no problem because $O_3$ reduces. It is similar to having $O_2$ as a fire control for a given operation. Since fire needs $O_2$ and the higher the $O_2$ the more chance of fire. For a given temperature (near combustion) there will be a critical value of $O_2$. We might monitor the level of this $O_2$ as a control. If it goes beyond this point combustion starts. Once the burning began we could expect small decreases in $O_2$ level but I don't think it would be safe to say we succeeded in our primary purpose of fire control!

P.64; Once again it should be pointed out that a 250 meter inversion height is too high and as such underestimates worst conditions. This is more typical of daily inversions than worst case. Also, it might be well to point out that Northern Tier's $NO_x$ concentrations (mill emissions) are considerably low.

87; Why are these values higher than for a print out of the same data ($SO_2$)? i.e. at 4.7 km 343.6μg/m³ vs 292.8μg/m³ and 72.7

P.88 The TCM does not show violations of $SO_2$, but VALLEY does. The VALLEY model incorporates crucial terrain modeling. Why then is the TCM data included? Even though isopleths P.88-92 show no standard violations at the Park Boundary. These values are also from TCM models, without terrain modeling, and therefore virtually useless.

P.63; Once again we imply Port Angeles pollution could actually decrease Tacoma and Seattle area pollution. Hydrocarbons have the potential to react with oxygen, this disrupts the nitrogen cycle. Freed O from sunlight and $NO_2$ reacts with $O_2$ faster than with hydrocarbons but the latter reaction still occurs fast enough to upset the nitrogen cycle; the O combines with hydrocarbons to form free radicals, these in turn react rapidly with NO upseting the nitrogen cycle. These free radicals also react with $O_2$and $NO_2$ to form PAN, a respiratory irritant. (Ref: Environmental Chemistry; Air and Water Pollution, Stoker.)

CONT

P.71; "Since the pumps are electric..." What is the source of operating power? In shortages where do the priorities lie? Is the assumption of the applicant in this issue of power similar to the assumption regarding berthing space? That is, local interests including historic uses will be ignored? The hydrocarbons from operating the pumping station and surge tank must be added to tanker emissions and tank farm emissions and to existing baseline data for a multiple source model, one again it seems that Norhtern Tier Corp. believes it can interpret when hydrocarbon emissions need to be considered. There are specific standards for hydrocarbons. Air quality standards do not combine $O_3$ and hydrocarbon concentrations. If $O_3$ standards are met hydrocarbon standards may not be violated. The analysts opinions are not a part of the standards. The report admits to an expectency of hydrocarbon excesses. Under present statutory restrictions such violations there fore prohibit the siting of this project.

P.74; The report states that the total emissions for the Clearbrook Terminal would be 260 tons per year for hydrocarbons. The figures for Port Angeles tank farm (the only ones given) are 205 tons per year. Since some ( as the proposed additional 350,000 BDD) oil will be released along the way the indication is that Port Angeles hydrocarbon emmissions are grossly underestimated. These values are crucial for adequate modeling of $O_3$ levels. As seen for Port Angeles, the $O_3$ estimates are likely incorrect. Why are the hydrocarbon emissions for the end of the pipeline estimated higher than the beginning?

P.77 Note the flatness of the $SO_2$ curve between 25% and 10%. This means the levels expected 10% of the time is not far off from those expected as 25% of the time. Stating that a given value would occur only 10% of the time can be misleading if this fact is not kept in mind. This applies through out the text.

P.79 The maximum scenario addressed by S.A.I., but not maximum projected with 26 tanks, indicates class II PSD violations at 5 km for $SO_2$ 5.9% at initial throughput and 8.2% for final throughput. This is equivelent to 32 days a year or if for 8 hour periods for four months. As indicated previously the wind direction data probably is in error resulting in low estimates. Also more realistic mixing heights are called for.

GENERAL OBSERVATIONS REGARDING THE PROJECT AND REPORT:

1. There is no mention of the effects of this project
   i.e. at .05 and 07μg/m³ $O_3$ certain plant damage - some severe
      Deterioration of rubber projects
      Odors
      Respiratory problems
      Visibility reduction
      etc.
2. No discussion of acid rain. It is regulated in some states. Clallam County has requested on record study of this impact.
3. No mention is made of the effects of pollution on the district with the highest percent old age (with population base 1000) in Wasthington.
4. Reid Vapor Pressure incorrect and not averaged for foreign oil
5. There will be hydrocarbon violations
6. There will be $SO_2$ violations of a multiple of standards (this report ignores an existing non-attainment area)
7. There are and will be particulate violations
8. There are possible $NO_x$ violations
9. There are very possible $O_3$ violations
10. Canadians haven't been considered (Clean Air Act recommendation)
11. Likely visibility violations within the Park looking out
12. PSD violations will occur
13. A National Wildlife Refuge will be endangered or degraded. Air quality and acid rain (also erosion) will effect it directly.
14. Mill emission estimates invalid (too low).
15. Assumed inversion height is incorrect -(too ~~low~~). high
16. Weather data is incorrect, wind speed and direction, and terrain patterns are not sufficiently noted.
17. Charts do not show terrain modeling (Valley) except in one case.
18. Evaluation of hydrocarbon data is deficient.
19. Model descriptions and assumptions not substantiated.

    Mill emission, daily and seasonal deviation, are not considered.

21. Weather yearly deviation not considered - only averages.
22. Factors increasing tank farm emissions not incorporated.
23. No mention is made of using best technology for emission control. Not utilizing vaport recovery systemmay constitute a Federal violation.
24. Crude $O_3$ analysis and failure to address secondary effects and levels and maximum concentration areas (PAN etc.).
25. Why were lab tests not done? What is the oil's chemical composition? An absolute must is the oil vapor's composition. The Reid Vapor Pressure question should have been resolved (using several independant testing labs).
26. Lack of Baseline data. Four years time is adequate to expect a weather/air quality monitoring network established.

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[illegible]

Since the BLM Draft Environmental Statement [illegible] from the Department of [illegible]

Sincerely yours,

[illegible]

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975 Draper Road
Port Angeles, Wa., 98362

March 26, 1979

Mr. [illegible] Cardullo
Director, Energy Transportation Project
Policy and Evaluation Division
Department of Energy
20 Massachusetts Ave., N. W.
Washington, D.C., 20545

Dear Mr. Cardullo:

Re: Draft Report—Volume 2
Petroleum Supply Alternatives for No. Tier and Inland States

Your study is undoubtedly written for those persons who are familiar with the "state of the art"; however, as a lay person, I wish to comment on your net energy analysis. I will refer specifically to pages C-35 through C-55 and will comment in that order.

As I understand, DOE figures are based upon data supplied by Waller Associates on the Northern Tier Pipeline Company project as of May 1, 1978. The fact that NTPC is continually amending its project description causes one to question the validity of using May 1, 1978 data. There are still numerous unanswered questions concerning NTPC design specifications and project engineering. This would significantly alter the net energy figure of the proposed system. For maximum credibility DOE's final report should incorporate the most up to date specs available for a project of this magnitude.

## Draft Review

1. Table C-13. There is an error in the "Million Btu" column. The figure "1,266,034,791" should read 1,266,791,021 million Btu, as stated on the total line of Table C-14. In light of possible mandatory conservation facing our nation, and the fact that consumers are being asked to conserve, it is significant that an error difference of 766,23[illegible] million Btu be corrected. This represents 224.5 million KWH or, enough electricity to service 9,000 homes for one year (based on current Clallam County consumption).

Your tables refer to "Million Btu" headings in the various tables; due perhaps to the layman's difficulty in comprehending quadrillion Btu's? All figures under these headings should have a decimal point after the last digit so that the reader will not misinterpret the volume. In asking several people to read the figures aloud from the tables, not one correctly interpreted them as quadrillion Btu.

2. Table C-14. Line 1: Tanker fuel should also include fuel to be used in transporting bunker fuel to the marine terminal, i.e., NTPC application states that bunker fuel may be transported from California to Port Angeles. If so, how much energy will be required for this delivery process? Line 2: Define "mainline stations," versus "pump stations." Identify how many mainline stations. Line 6: Identify how many "pump and water wells." Line 7: Identify how many "emergency generators." Where are delivery facilities at four sites identified in these tables?

3. Table C-15. TOTAL ENERGY DELIVERED. This is the critical factor to a net energy analysis. The figures are based on NTPC assumptions. There is no current guarantee that throughput volume/percentages will be contracted. No accurate comparison of energy delivered versus energy consumed can be calculated unless the figures in Table C-15 are factual. Footnote (c) alludes to this assumption: ". . .energy content of each type of crude oil expected to flow through the system." What if it doesn't flow in the percentages and volume quoted? Again, no accurate energy comparison can be made unless these figures are factual.

4. Table C-16. Again, questionable figures based on [illegible] data.

5. Table C-17. Identify "mainline stations." Footnotes reveal the DOE source, but the table doesn't allow the reader to easily identify the data. Is the tank farm facility included in this table? If not, in what table is it incorporated? Will the oil need to be reheated for transmission through the pipeline? If so, where are the heating energy requirements identified in the tables?

Table C-18. Footnote (a). Does the energy cost affect the primary energy coefficient? If so, does the figure "4.0683" represent energy cost based on thermal or on hydroelectric power?

7. Table C-19. Does this table apply to operation requirements only? What about construction electrical requirements? There is an error in the last column heading. "Total Energy Million KWH" should read "Total Energy Million Btu."

CONT

Footnote (b) states "The City of Port Angeles will supply electrical power for the booster pump motors along with power required by the berthing facilities and the booster pump platform auxiliaries. . . ." Please identify the City of Port Angeles source for this statement.

8. Table C-20. "Primary energy coefficient." Please refer to comments under 6.

9. Table C-21. These figures are questionable unless the reader can easily relate to tanker size and number of ships. Please incorporate this data in the table. The SOHIO project (Federal E.I.S.) stated requirements of 9,500 barrels per day (bunker fuel) for a throughput of 700,000 bpd. (SOHIO E.I.S., page 7-8). Why does NTPC state 9,119 bpd for a throughput of 909,000 bpd?

The second column heading should read "Tanker Fuel Requirements (Barrels per day)" for clearer interpretation. Energy required to deliver bunker fuel to the marine terminal should be incorporated in this table. (See comments under no. 2.)

10. Table C-22. Figures in column one do not represent accurate tanker fuel requirements unless preceding comments are considered.

Table C-23. The table title should be clarified. Does this represent construction materials for all facilities? (Marine terminal, tank farm, pump stations, delivery facilities at four sites, and the pipeline?) There is a question as to whether or not NTPC is committed to building the four delivery facilities. In any event, energy requirements for them should be incorporated in an energy analysis of the system. How valid are these figures when design specifications and project engineering are still changing?

12. Table C-24. ENERGY CONSUMED IN FUEL USED DURING CONSTRUCTION. Why doesn't this table also incorporate fuel to be used during operation of the system? What about fuel for ground vehicles? for the helicopter at the tank farm? for the bi-weekly airflight along 1,500 miles of pipeline for twenty years? The operational volume of fuel should be calculated and incorporated in a table.

13. Table C-25. This table requires clarification and specific breakdown for meaningful interpretation. Does it represent energy embodied in pump station operation, or pump station construction? If it represents energy embodied in construction, identify the breakdown of construction materials such as in Table C-23. If it represents energy in operation, identify how many pump stations and how many delivery stations.

14. Table C-26. This table represents energy consumed for routine maintenance of emergency generators only. What amount of energy would be used in actual emergency situations? A projected volume should be calculated and incorporated in this table.

None of the above tables calculate energy consumption based on a NTPC throughput of 1.2 million bpd. In light of NTPC's plans (as of March 23) to route the pipeline across Puget Sound, a 1.2 million bpd throughput should be incorporated in all of the above tables.

The Department of Energy is required by law to analyze and evaluate alternative systems in terms of net energy. At the February 27, 1979 meeting in Port Angeles, you stated that this information would be forthcoming and incorporated in the DOE final report.

In order to make accurate, credible comparisons, DOE should analyze projects in their final design stage and with delivery contracts. If a company can say they will have a potential for X amount of delivery and will require X amount of energy (without definite verification of such results) these amounts are only project selling features. The net energy comparison should be between alternative systems for a true comparison of energy efficiency.

Sincerely yours,

Karen Thoraldsen

CC: [illegible] Doherty
[illegible] Force Coordinator

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TESTIMONY
BEFORE
THE BUREAU OF LAND MANAGEMENT
PORT ANGELES, WASHINGTON
MARCH 15, 1979
BY
PAULA [illegible]

I have two principal concerns I would like to discuss. One area of concern is OIW's risk analysis. My concerns are primarily with OIW's methodology which, I believe, is basically faulty. At the outset, I would mention that OIW's involvement in the area of risk analysis of crude oil transportation on Greater Puget Sound is not without controversy.

In 1972, the Oceanographic Commission of Washington published a Risk Analysis of the Oil Transportation System which was, in essence, a prelude to the growing debate over tankers in Puget Sound. I believe you will find that this is the only report published by the OCW on this issue which approached objectivity. In 1974, after lengthy legislative debate, the OCW published an offshore petroleum transfer systems feasibility study which was designed to demonstrate the viability of a major oil port "at or west of Port Angeles." OCW's report did not escape legislative criticism. The Legislature later criticized the study for its bias.

Subsequently, in 1975, the OCW promulgated a four-point State Oil Transportation Policy which not only advocated a new single, common-use crude oil terminal at a site in the Port Angeles "vicinity," but also proposed that the State encourage construction of such a terminal through an economic incentive. In 1977, the OCW went one step further and urged the 45th Legislature of the State of Washington to enact legislation which would site a new crude oil terminal at or west of Port Angeles. At that point, the OCW got into the business of proposing and promoting legislation on this issue. It is a serious concern that BLM would let a contract for risk analysis to an institution with that kind of bias. We acknowledge that the Oceanographic Institute of Washington, as distinct from the Oceanographic Commission of Washington, is a research institution. But we also recognize that the OIW is the corporate arm of the OCW. The enabling statute of the State of Washington clearly states that: "The OCW shall...coordinate, promote and carry out such policies...as may be formulated by the Commission." (RCW 43.94.090) I believe, therefore, that the entire work product by OIW for this EIS is subject to question...

In light of the OCW's espoused position on this issue then, it is not at all surprising that the OIW's risk analysis performed for BLM continues to allege the comparative assets of an oilport at or west of Port Angeles. In fact, to quote OIW's current work product, this latest effort merely "constituted a refinement by the OIW of past risk analysis methodologies, many of which used port calls as the exposure variable." (Fires & Explosions: II-1)

It is interesting to note that back in 1972, before the OCW had a position on this issue, the OIW did not embrace this methodology so enthusiastically. In fact, OCW gave credence to the contention that "you can't compare ports because the topography is different and the number of ships utilizing any two ports may be significantly different." (p.357) For example, just as you can't compare Port Valdez and Rotterdam, you can't compare the Strait of Juan de Fuca and North Puget Sound. Of the approximately 5,000 vessels entering the VTS at Cape Flattery and traversing the Strait of Juan de Fuca, only 7% proceed to North Puget Sound. Less than that ever reach Cherry Point. That constitutes a staggering difference in vessel traffic densities between the navigational approaches to Port Angeles and Cherry Point. It is evident to most lay people that the Strait of Juan de Fuca sustains the maximum traffic density of Washington's inner waters. Port calls are clearly secondary to site exposure based upon traffic densities.

To pursue this further, I would like to examine what a comparison of Cherry Point and Port Angeles on the basis of port calls really means. It is true that x number of tankers call at Anacortes each month, y number of tankers call at Cherry Point each month, z number of tankers call at Tacoma each month, and so forth. Apart from occasional layovers at Port Angeles, none of these tankers literally call at Port Angeles. Yet all of these tankers traverse the Strait of Juan de Fuca, regularly exposing Clallam County and Vancouver Island to the risk of a major oil spill. The net impact of x, y and z tanker traffic is concentrated in the Strait of Juan de Fuca--not at Cherry Point. This, of course, is not only not reflected in the OIW risk analysis but clearly circumvented.

OIW and BLM go on to postulate that the longer the distance traveled for a port call, the longer the tanker is exposed to hazards and events that cause casualties. (II-2) I would like to repeat that: "...the longer the tanker is exposed..." Is this EIS assessing risk probabilities associated with a migrant tanker fleet enroute to inner Puget Sound or is this EIS attempting to assess the frequency with which alternate port sites are actually exposed to tanker-related casualties?

In order to consider this in a larger perspective, I would like to cite the methodology section of another Federal EIS, published by the FEA in 1976 (Mandatory Canadian Crude Oil Allocation Regulations/DES 76-1; A-4) which acknowledges that the incidence of both tanker casualties and spills is proportional to the length of time and number of times tankers spend in various waterways. Port calls and distance were not factors.

One additional comment about OIW's approach to comparative site assessments. To quote the draft EIS: "It was assumed that the current ban on tankers greater than 125,000 dwt east of Port Angeles did not apply. This allowed comparison of all of the alternate port sites with the proposed Port Angeles site."

CONT

First, there are currently no proposals for a transshipment facility at either Burrows Bay or Cherry Point. Secondly, current Federal law precludes any serious consideration of such a facility east of Port Angeles. Thirdly, a current Federal administrative order precludes supertankers from inner Puget Sound.

Then why is BLM and OIW using inner Puget Sound port locations as hypothetical port alternatives? Why is BLM and OIW dwelling on potential incremental risk based on distance traveled to Cherry Point when all factors are far from equal? Quite frankly, I see little merit in this kind of approach except for serving the express policies of the Oceanographic Commission of Washington. If BLM felt the need to make comparisons with inner Puget Sound site locations, then why weren't the comparisons realistic?

In concluding my comments on the risk analysis methodology, I would like to quote OCW's 1972 report: "The final test of any mathematical model is how well it fits physical reality...But the key to testing the 'goodness of fit' of a mathematical model is the use of an adequate and unbiased data base...Once we start compromising the data base, the results can go from fair representation to being totally misleading." (p.365)

I believe that aptly summarizes my differences with OIW's 1979 risk analysis for this EIS. I would suggest that OIW and BLM have seriously compromised the risk analysis methodology and the result is "totally misleading."

My second area of concern is the issue of secondary development as a result of this project proposal. The EIS disposed of this issue in two references which I would like to read:

(3-50) "Additional petroleum-based industry is unlikely."

(5-2) "The location of Port Angeles is economically not conducive for the development of refineries or petrochemical plants."

This constituted the discussion of this issue. I believe it is grossly inadequate. In addition, I believe both statements are ill-founded. In fact, because I was perplexed by the conclusory nature of these statements, I called the Portland Office and spoke to Mr. John Booth, who was responsible for this judgement. He could not cite a specific reference upon which this judgment was based. It was the product of the EIS team's personal judgment.

By contrast, I would like to refer to another Federal EIS on another deepwater oil port facility--the final EIS on the LOOP Deepwater Port License Application. That EIS devoted 5 separate sections plus 62-pages in the Appendix to the issue of secondary development. These were some of the findings:

-- "Historically, refining capacity has tended to locate where the crude is. A correlation analysis between refining capacity and crude oil production for Louisiana revealed that the co-efficient of correlation was .89." (or 89%) (1-15)

-- "As domestic oil production in PAD III declines, new refinery growth will have to depend on foreign crude and will tend to be built where foreign crude oils can be most readily obtained, i.e. in the coastal region. Refineries will also tend to locate on the coast to allow ready access to pipeline networks and tanker transportation systems which deliver products to markets outside PAD III. Another minor reason for locating on the coast is that a refinery uses a part of its crude oil supply (often 3-5%) as fuel to run the refinery. Moving crude a long way thus increases the cost of refinery fuel, and given the opportunity a refiner will minimize such costs." (C-95)

The point I would like to underscore is that we consider this an important issue. The U.S. DOT seemed to consider this an important issue in the development of the EIS on the LOOP deepwater port facility. Yet, BLM has not responded to public input on this matter. Clallam County is on record as early as June 2, 1977, (nearly 2-years ago) requesting that this be given due consideration by the EIS team. Clallam County reiterated that concern again on January 10, 1978. It was verbally reiterated at 3-meetings of the BLM Coordinating Committee by the then Chairman of the Board of Clallam County Commissioners.

It seems to me, this is a proper concern of local government and one that NEPA requires a lead agency to fully examine. A publication by the United States Coast Guard entitled: Guide to Preparation of Environmental Analysis for Deepwater Ports acknowledges this obligation as well. I would like to quote it:

> "Since the construction of a deepwater port is likely to entail many second-order and higher order costs and benefits (such as the effect of terminal associated refining and petrochemical activity, and the indirect effects of this activity), and since they may be very large, the applicant should discuss them thoroughly." (5-5)

Again, I would like to quote the LOOP EIS:

> "The development pressures stemming from petroleum-related industrial growth... will create a need for major new public expenditures. For example, about $3billion will be required for new schools, utilities, street and roads and other public facilities by 2000-2010. LOOP-related activities will contribute to these needs.
>
> "This situation has the potential for adversely affecting the operation of local governments in the Corridor for significant periods over the next 35-years...A number of local governments will be hard pressed to fund new facilities and services during these times." (5-11)

It is estimated that U.S. consumer product needs will require 17 new refineries before the year 2000. An article in Monday's Seattle PI (3-12-79) reaffirmed this. It is the apparent consensus of government, congressional and oil industry energy experts that, contrary to popular belief, the current petroleum shortage is not due to the Iranian cutoff. Rather, it is the lack of U.S. refinery capacity--not the loss of Iranian oil--which is responsible for the shortfall.

Where will these new refineries locate? They have historically located where the crude oil is, not where the market is. A good example of this is, again, the Gulf Coast. Approximately 55% of all products refined along the Gulf Coast is shipped out of that region. (C-84) The two largest product pipeline systems in the U.S. originate in the Gulf region. One extends from Baton Rouge, La., to the Washington D.C. area and the other extends from Texas to the New York-New Jersey area. Transit time of a product barrel is approximately 12-days from Houston to New York. (C-84) By comparison, then, the Olympic Peninsula is by no means an unrealistic location for a refinery with access to the entire West Coast product market via both waterborne vessel or by pipeline connection with the Olympic Product Pipeline System.

This is not a condition endemic to the Gulf Coast. A similar scenario is occurring in the State of Alaska. During 1977-78, eleven different proposals were submitted to the Alaska Oil and Gas Royalty Board for new refineries. (OGJ 9-26-77) A refinery will be sited at Valdez. The same thing could occur at Port Angeles. If Port Angeles becomes the site of the country's largest onshore crude oil terminal, as is proposed for this project, then Port Angeles is an equally likely candidate for refinery development.

A key element of the U.S. Corps of Army Engineers West Coast Deepwater Port study was the liklihood of refineries locating in the vicinity of a new deepwater port. In fact, each port site the Corps considered, including Port Angeles, was evaluated in terms of the feasibility of that Port site for refinery development. Port Angeles was a feasible location.

According to the U.S. DOE's recently released petroleum supply alternatives for the northern tier and inland states: the State of Washington can expect an increase in refinery output of over 200,000 b/d by the year 2010. That is the equivalent of 2 new refineries.

On April 28 (8-months before the publication of this Draft Statement) Region X of the DOE transmitted to the BLM an interim report on the northern route supply and demand situation. On page 78 of that report was the following statement: "Standard Oil of California is now considering building a new refinery in Washington..."

On January 22 of this year, it was announced that American Petrofining plans to locate a 250,000 b/d refinery in Western Washington. The Port Angeles area is a candidate site.

In summary, I would say that BLM has not fulfilled its responsibilities under NEPA to fully examine secondary development as a logical consequence of a major crude oil terminal at Port Angeles. It is only realistic to expect that a 1.25 [illegible] b/d oilport is only a foot in the door.

I will be submitting additional comments in writing. Thank you.

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1515 S.E. Flavel St.
Portland, Oregon 97202
23 March 1979

U.S. Dept. of the Interior
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

To those persons considering comment on the proposed Northern Tier Pipeline Company oil tanker port in Port Angeles, Washington:

I am a 36-yr. old wife, mother, and student, now living in Portland. Our family is planning to move to Port Angeles, Washington. The small size of the community and the natural beauty of its surroundings were major factors in our decision to move there. Because the proposed oil tanker port and storage facilities in that area certainly would have far-reaching effects on Port Angeles, I have been trying to find out more about it and would like to have my comments added to the public record of recent hearings on the draft environmental statement. Here are some facts I have learned:

① Construction and operation of the proposed oil facilities would contribute to air quality deterioration in Port Angeles, which is literally in the back yard of the Olympic National Park.

② Oil spills during transit and unloading operations are considered inevitable. Although the chances of a major spill occurring are considered slight, the cumulative effect of frequent minor spills which are expected will be detrimental to the quality and to the existence of local marine [illegible] and fauna.

③ Recreational use and aesthetic values of the harbor area would be greatly reduced by increased traffic of large tankers.

CONT

④ Location of port and storage facilities presents the problems of increased demand on present electric power supplies. Nobody knows where the additional electrical power would come from.

⑤ Cliff stabilization at the storage site may well have a severely detrimental effect on the National Wildlife Refuge at Dungeness Spit by depriving it of its natural sediment supply.

⑥ Heavy industrialization of the Ediz Hook area will greatly decrease aesthetic quality of the waterfront area and will also make it more attractive to other petroleum-based industry.

⑦ The pipeline as proposed would be near one active fault.

⑧ Damage to bald eagle habitat is likely.

⑨ In the March 24 issue of the Oregonian, a front-page story announced that due to their environmental studies, Northern Tier is now proposing that the pipeline route be changed so that it can carry crude oil to existing refineries at Anacortes and Cherry Point, making present tanker traffic within the Sound unnecessary. What the article failed to say was that (according to the draft environmental impact statement) such an alternate plan would necessitate making the tanker port at Port Angeles even bigger!

Poor little Port Angeles! It seems to me that because it is small and unspoiled, it seems unimportant, even to the Washington Legislature, which has already said in so many words that no oil tanker port may be built in the state east of Port Angeles! To me, the smallness and unspoiled nature of Port Angeles are the most important reasons why it should not be exploited. Quality of life in the area will certainly decline. This is a highly subjective consideration, of course, but quality of daily life is extremely important to the people of the Pacific Northwest. I bet the reason most of the people in Port Angeles love it there is the quiet,

the slower pace, the great natural beauty of the area. Why else would they have passed a resolution in the 1976 elections saying they did not want an oil port in their community? Whose voice is more important, those who will become rich because of the oil tanker port, or those who live there? I, for one, would have voted with the majority to pass that resolution, and I say to you now: put the oil port, if there must be one, somewhere where there are already existing tanker port facilities. It makes more sense in many different ways.

Sincerely,
Patricia A. Burkhardt

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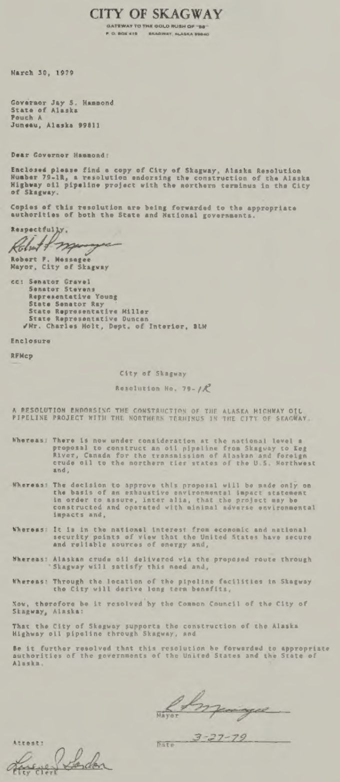

CITY OF SKAGWAY

GATEWAY TO THE GOLD RUSH OF "98"

P. O. BOX 415 SKAGWAY, ALASKA 99840

March 30, 1979

Governor Jay S. Hammond
State of Alaska
Pouch A
Juneau, Alaska 99811

Dear Governor Hammond:

Enclosed please find a copy of City of Skagway, Alaska Resolution Number 79-1R, a resolution endorsing the construction of the Alaska Highway oil pipeline project with the northern terminus in the City of Skagway.

Copies of this resolution are being forwarded to the appropriate authorities of both the State and National governments.

Respectfully,

Robert F. Messegee
Mayor, City of Skagway

cc: Senator Gravel
Senator Stevens
Representative Young
State Senator Ray
State Representative Miller
State Representative Duncan
✓Mr. Charles Holt, Dept. of Interior, BLM

Enclosure

RFMcp

City of Skagway

Resolution No. 79-1R

A RESOLUTION ENDORSING THE CONSTRUCTION OF THE ALASKA HIGHWAY OIL PIPELINE PROJECT WITH THE NORTHERN TERMINUS IN THE CITY OF SKAGWAY.

Whereas: There is now under consideration at the national level a proposal to construct an oil pipeline from Skagway to Keg River, Canada for the transmission of Alaskan and foreign crude oil to the northern tier states of the U.S. Northwest and,

Whereas: The decision to approve this proposal will be made only on the basis of an exhaustive environmental impact statement in order to assure, inter alia, that the project may be constructed and operated with minimal adverse environmental impacts and,

Whereas: It is in the national interest from economic and national security points of view that the United States have secure and reliable sources of energy and,

Whereas: Alaskan crude oil delivered via the proposed route through Skagway will satisfy this need and,

Whereas: Through the location of the pipeline facilities in Skagway the City will derive long term benefits,

Now, therefore be it resolved by the Common Council of the City of Skagway, Alaska:

That the City of Skagway supports the construction of the Alaska Highway oil pipeline through Skagway, and

Be it further resolved that this resolution be forwarded to appropriate authorities of the governments of the United States and the State of Alaska.

Mayor

Date 3-27-79

Attest:

City Clerk

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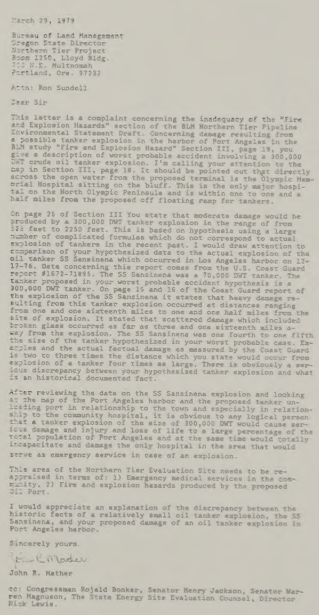

March 29, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Bldg.
700 N.E. Multnomah
Portland, Ore. 97232

Attn: Ron Sundell

Dear Sir

1 This letter is a complaint concerning the inadequacy of the "Fire and Explosion Hazards" section of the BLM Northern Tier Pipeline Environmental Statement Draft. Concerning damage resulting from a possible tanker explosion in the harbor of Port Angeles in the BLM study "Fire and Explosion Hazard" Section III, page 19, you give a description of worst probable accident involving a 300,000 DWT crude oil tanker explosion. I'm calling your attention to the map in Section III, page 18. It should be pointed out that directly across the open water from the proposed terminal is the Olympic Memorial Hospital sitting on the bluff. This is the only major hospital on the North Olympic Peninsula and is within one to one and a half miles from the proposed off floating ramp for tankers.

On page 26 of Section III You state that moderate damage would be produced by a 300,000 DWT tanker explosion in the range of from 125 feet to 2250 feet. This is based on hypothesis using a large number of complicated formulas which do not correspond to actual explosion of tankers in the recent past. I would draw attention to comparison of your hypothesized data to the actual explosion of the oil tanker SS Sansinena which occurred in Los Angeles harbor on 12-17-76. Data concerning this report comes from the U.S. Coast Guard report #1672-71895. The SS Sansinena was a 70,000 DWT tanker. The tanker proposed in your worst probable accident hypothesis is a 300,000 DWT tanker. On page 15 and 16 of the Coast Guard report of the explosion of the SS Sansinena it states that heavy damage resulting from this tanker explosion occurred at distances ranging from one and one sixteenth miles to one and one half miles from the site of explosion. It stated that scattered damage which included broken glass occurred as far as three and one sixteenth miles away from the explosion. The SS Sansinena was one fourth to one fifth the size of the tanker hypothesized in your worst probable case. Examples and the actual factual damage as measured by the Coast Guard is two to three times the distance which you state would occur from explosion of a tanker four times as large. There is obviously a serious discrepancy between your hypothesized tanker explosion and what is an historical documented fact.

After reviewing the data on the SS Sansinena explosion and looking at the map of the Port Angeles harbor and the proposed tanker unloading port in relationship to the town and especially in relationship to the community hospital, it is obvious to any logical person that a tanker explosion of the size of 300,000 DWT would cause serious damage and injury and loss of life to a large percentage of the total population of Port Angeles and at the same time would totally incapacitate and damage the only hospital in the area that would serve as emergency service in case of an explosion.

This area of the Northern Tier Evaluation Site needs to be reappraised in terms of: 1) Emergency medical services in the community. 2) Fire and explosion hazards produced by the proposed Oil Port.

I would appreciate an explanation of the discrepancy between the historic facts of a relatively small oil tanker explosion, the SS Sansinena, and your proposed damage of an oil tanker explosion in Port Angeles harbor.

Sincerely yours,

John R. Mather

cc: Congressman Rojald Bonker, Senator Henry Jackson, Senator Warren Magnuson, The State Energy Site Evaluation Counsel, Director Nick Lewis.

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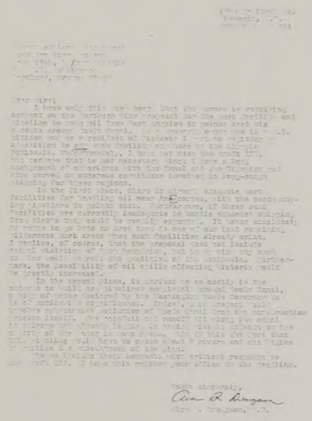

[illegible]

Dear Sirs:

[illegible]

Yours sincerely,

[illegible]

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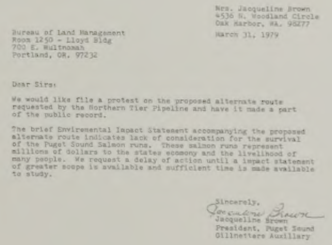

Mrs. Jacqueline Brown
4536 N. Woodland Circle
Oak Harbor, WA. 98277

March 31, 1979

Bureau of Land Management
Room 1250 - Lloyd Bldg
700 E. Multnomah
Portland, OR. 97232

Dear Sirs:

We would like file a protest on the proposed alternate route requested by the Northern Tier Pipeline and have it made a part of the public record.

1 The brief Envirementel Impact Statement accompanying the proposed alternate route indicates lack of consideration for the survival of the Puget Sound Salmon runs. These salmon runs represent millions of dollars to the states ecomony and the livelihood of many people. We request a delay of action until a impact statement of greater scope is available and sufficient time is made available to study.

Sincerely,

Jacqueline Brown
Jacqueline Brown
President, Puget Sound
Gillnetters Auxillary

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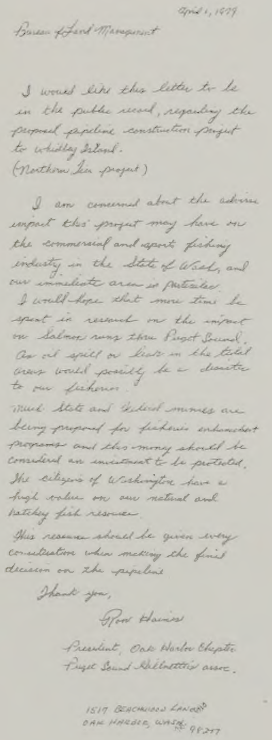

April 1, 1979

Bureau of Land Management

I would like this letter to be in the public record, regarding the proposed pipeline construction project to Whidbey Island.
(Northern Tier project)

I am concerned about the adverse impact this project may have on the commercial and sport fishing industry in the State of Wash, and our immediate area in particular.
I would hope that more time be spent in research on the impact on Salmon runs thru Puget Sound.
An oil spill or leak in the tidal areas would possibly be a disaster to our fisheries.
Much State and Federal monies are being proposed for fisheries enhancement programs and this money should be considered an investment to be protected.
The citizens of Washington have a high value on our natural and hatchery fish resource.
This resource should be given every consideration when making the final decision on the pipeline

Thank you,

Ross Haines

President, Oak Harbor Chapter
Puget Sound Gillnetters assoc.

1517 BEACHWOOD LANE
OAK HARBOR, WASH. 98277

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United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
PORTLAND AREA OFFICE
POST OFFICE BOX [illegible]
PORTLAND, OREGON [illegible]

IN REPLY REFER TO:
Land Services

APR 2 1979

Memorandum

To: Bureau of Land Management
Oregon State Office
Northern Tier EIS Task Force
Post Office Box 2965
Portland, Oregon 97208

From: Office of the Area Director

Subject: Draft Environmental Impact Statement for the Northern Tier Pipeline Proposal (DES 79/3)

We have received responses from the Aberdeen and Billings Area Offices of the BIA. Both do not have comments on the draft. The Billings Office was concerned when the plan was to cross the Flathead Indian Reservation where the Tribes are opposed to granting rights of way. However, on February 16, a BLM News Release announced a route change identified as the "Ninemile Creek -- Helmville route segment." This route by-passes the Flathead Indian Reservation. Consequently, if this alternate is used, concerns with adverse impacts on reservation have been eliminated.

In the Portland Area BIA jurisdiction, the proposed route runs adjacent to the Skokomish Reservation in Washington and crosses the Coeur d'Alene Reservation in Idaho. Potential impact on fisheries and water quality in Puget Sound, at stream crossings, and where the pipeline is located in drainage areas that would allow oil spills to enter streams or lakes is of major concern. Significant Indian fisheries exist in the Skokomish, Nisqually, Muckleshoot, Yakima and Columbia rivers — all of which would be crossed.

① One overall comment is the lack of specific information regarding stream crossings — details concerning the crossing method (in the air or in the stream) will be determined later, this is unsatisfactory. The fact that the company will comply with appropriate regulations does not enable the reader to understand the results that could occur. If the only concern were regulation compliance, there would be no need to prepare an EIS.

In recent weeks, newspaper and other news media accounts of Northern Tier activity have indicated that the Cross Puget Sound alternative has become one of the preferred route segments. A number of the Western Washington Tribes have passed formal resolutions opposing the approval of this alternative. Of course, the major concern is related to the potential damage that a spill could cause. The potential for an undetected leak to release from 144,900 gallons (at 709,000 barrels per day flow) to 195,720 gallons (at the 933,000 barrel flow) is not satisfactory. In addition, it would apparently be difficult to identify and stop because the leak would continue until visually noticed. Because there is insufficient data on the sub-bottom, the potential for earthquakes, leak detection inadequacies, possible dragging ship anchors, and other factors, we believe that this segment, if it is being seriously considered, should be planned in much more detail than now exists. It is so significant that a separate EIS should be required.

Pipe line leakage sensing equipment will be capable of detecting deviations of 0.5% of pipeline (pg 1.31) at which time an alarm would be given, the dispatcher would move to isolate the leak, and ultimately the leaking section of the line would be shut down. At 709,000 bbls/day, 0.5% is 3545 bbls/day which presumably could go undetected. However, if all the alarm systems work correctly, and if we have a sudden, specific leak the system will sound the leak alarm within 2 minutes. In 2 minutes a 0.5% leak at 709,000 bpd is approximately 4.9 bbls. This means that 205 gallons of crude oil spill before the alarm will sound and before the dispatcher starts to hunt the leak. Nothing in the statement implies the leak will be stopped in 2 minutes, just that an alarm will sound. Pg 3.70 indicates 12 minutes to accomplish shutdown. Table 3.26-2 Maximum Potential Oil Spill indicates the minimum detectable oil spill on any stream crossing which requires a Corps of Engineers permit, is 490 bbls. ② Minimums on smaller streams are not given. Minimum detectable on the Yakima River is 2600 bbls (109,200 gallons), minimum detectable on the Columbia River is 6300 bbls (264,600 gallons). There must be a better solution. Detection equipment that offers minimum spills of over a quarter of a million gallons in the Columbia River seems inadequate.

③ At Green Bluff it is proposed to excavate the bluff to bury the pipeline. Excavation (according to the EIS) increases danger of slides along the bluff, removes the existing ground cover, and represents a visual impact of considerable magnitude, that cannot be effectively mitigated and will not be relieved upon abandonment of the pipeline. We have looked for an explanation of alternatives that were considered rather than undertake such an excavation. Perhaps we have overlooked the discussion. At any event it seems some effort should have been devoted to exploring alternatives and explaining them. Why was a ditch considered rather than a tunnel? Under this particular set of circumstances the long term environmental effects should be much less severe.

We are concerned with possible sediment impact on aquatic resources, especially the anadromous fishery in the upper Yakima River area. This includes crossing the Yakima, its tributaries and the Columbia River.

Potential oil spill impact will exist in the area from Keechelus Lake to the Yakima River, a distance of about 28 miles. Just below Cabin Creek, the line crosses a potentially active fault near pipleline mile 229. Yakima tribal biologists indicate that salmon spawn in this stretch of the Yakima River between Cle Elum and Easton. Along these stretches of the pipeline (mile 215 to 242) there are significant areas of possible liquifaction and slope instability. These hazards are all indicators of the serious potential that we see for threatening the deterioration of the fishery.

④ There is also the possibility of the pipeline affecting an Indian trust allotment under the Yakima Agency jurisdiction. The allotment (#154-HA-355) is less than 1/4 mile south of the pipeline approximately at mile 266. Naneum Creek passes through the west side of the allotment just below its crossing by the pipeline. If the owner is living on the allotment at the time of construction, the site would be subject to "fugitive dust" and traffic impacts.

Many known historical and archeological sites are within the two mile corridor of the pipeline. There are at least ten in the vicinity of the Columbia River crossing. The potential for discovery of other as yet unknown sites is high, especially in the vicinity of the Columbia River crossing. We are concerned that the historic and prehistoric records of Indians in the Columbia Basin be preserved if at all possible. All applicable laws, such as Section 106 of the Historic Preservation Act must be complied with and mitigative measures implemented.

CONT.

The proposed crossing of the Coeur d'Alene Reservation has been under active review by our Northern Idaho Agency and the Coeur d'Alene tribe. The tribe has been in direct contact with Northern Tier representatives.

⑤ In reference to cropland crossing, we feel that additional information should be developed on surface soil temperature over a pipline buried at three feet and at five feet before settling on a three foot depth.

⑥ The Standards applying to the Forest Service and Reclamation lands on page 4-2, 4.5 Soils, should apply to all lands crossed by the pipeline (the statement says -- "would substantially reduce soils impacts if required...." No. 2 in the same Section, where it reads -- "not to exceed 30 inches in depth" should be changed to read "not to exceed 60 inches in depth through cropland and not to exceed 30 inches in forest and rangelands except at stream crossings."

⑦ On page 5-13, 5.25 Soils, second paragraph, second sentence, "Loss of vegetation and topsoil disturbance and alteration would cause an estimated 5% loss in soil productivity should be amended to read "... .5% or more permanent loss in soil productivity."

⑧ On page 5-15, Operation Phase, fourth paragraph, it should be rewritten as follows: "Soil productivity would be unavoidably lost for the life of the pipeline on areas occupied by pump stations, pressure reducing stations, block valve locations, access roads and other facilities until the facilities are removed and the area returned to vegetative cover."

⑨ On page 5-21, second paragraph, remove the following from the last sentence. "Tribal lands would not be affected on the Coeur d'Alene Reservation." The Coeur d'Alene tribe claims ownership of the St. Joe riverbed and the tribe is in the process of purchasing an interest in Allotment 138.

Hydrostatic test pumping from Rock Creek and Plummer Creek could only be done during high water flow period without impacting aquatic life of the streams.

⑩ In several places the statement refers to the economic lifetime of the project as being 20 years. On page 17 of the summary report, the first paragraph states "the proposed project has a 20 year economic lifetime. However, many pipelines have operated for 30 to 50 years and the NTPC project would be designed to operate for a period longer than 20 years.

We have the following questions:

1. What length of time is the Northern Tier pipeline designed to be used?
2. What is the definition of "Economic life" as used in the statement?
3. Will adverse impacts increase after the 20 year economic life of the pipeline?
4. What maintenance problems are anticipated when the pipeline is old?
5. Are there other alternate uses for the pipeline besides oil transportation? If so, what are they and what other hazards may be associated with those uses?

The extreme differences of climate and terrain make it difficult to analyze the statement. If it were broken into smaller geographically similar sections, or at least by State, the interrelationships would be more readily understood than the extensive and frustrating intermixing that occurs in the present draft. This statement appears to us to be a programmatic environmental statement, which will assist in general decision making first in determining if such a transportation system is necessary, then in deciding if this system and general route provides more overall benefits than others. If this system is chosen, and when specific plans are available, in depth EIS's could be made on specific projects which will have significant environmental impacts.

We have been frustrated in attempting to evaluate this EIS. Page 5-13, Section 5.2.5 Soils, Construction Phase, first paragraph says "Quantification of residual impacts along the pipeline is complicated by the diversity of soils topography, protective ground cover and climate. Insufficient data at many locations does not permit quantification even in a very general sense." This statement is applicable in principle to the entire EIS.

In our opinion, considering the impossible time constraints, the task force did a commendable job with the information available to them. However, the pipeline company (if they are in large measure responsible for providing data) needs to provide the task force with more specific information on location and design features so the EIS can adequately discuss impacts of the proposal. More information on how the line and facilities actually would lie on the terrain should be made available.

Acting Assistant Area Director
(Economic Development)

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City of Port Angeles
TOURIST MECCA OF THE NORTHWEST
140 WEST FRONT STREET PORT ANGELES, WASHINGTON 98362

March 28, 1979

Bureau of Land Management
Oregon State Office
729 Northeast Oregon Street
Portland, OR 92708

Re: Draft EIS on Northern Tier Proposal

Gentlemen:

① After speaking at the public hearing on the draft EIS on the Northern Tier Project in Port Angeles on March 15, 1979, a copy of the document forming the basis for my remarks was not included in that record. A copy is here enclosed. I would request that this be considered as comment upon the draft EIS, in addition to the testimony earlier given.

Thank you for your attention to this matter.

Very truly yours,

Craig L. Miller
City Attorney

CLM:LF
Enclosure

BEFORE THE U.S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

In the matter of the )
)
DRAFT EIS FOR THE PROPOSED )
PROJECT OF THE NORTHERN TIER )
PIPELINE COMPANY )
)

COMMENTS FROM THE CITY OF PORT ANGELES UPON DRAFT ENVIRONMENTAL IMPACT STATEMENT

## INTRODUCTION

The City of Port Angeles welcomes this opportunity to state to the Bureau of Land Management its comments on the proposed Northern Tier Project. Once before, on March 8, 1978, the City commented to the Bureau of Land Management on what it saw as probable or potential impacts from the Northern Tier proposal, which impacts the City hoped the authors of the environmental impact statement would investigate in the EIS process. A draft EIS has now been prepared, which the City has reviewed, and upon which oral comment is now being taken. The City wishes to make a statement at this time, as well as a written submission later, to emphasize its concerns over the impacts of the Northern Tier project. The City's remarks will be directed toward: 1.) matters earlier expressed, and the extent to which the impact statement has addressed those problems; and 2.) additional areas of concern which have arisen since the time of the City's earlier comments.

Due to the limitations imposed by the public hearing process, this statement of the City constitutes only a discussion of certain issues for the purposes of an oral hearing. A more detailed and exhaustive written review of the EIS is in preparation by the City, and will be presented to BLM by the April 2, 1979 closing date for written comments. That written submission will contain data collected by a citizen's task force created by joint action of the City of Port Angeles and Clallam County.

This present statement is designed mainly to illustrate the City's basic opinion on the EIS, which is that it has ignored or but lightly treated previously expressed concerns of the City of Port Angeles, and that it has failed to provide both a detailed

CONT.

and a neutral investigation of the environmental impacts of the project. These shortcomings make the impact statement a flawed document, and if they are not corrected in the final impact statement, it will not serve as an adequate decision-making device for the Secretary of the Department of the Interior, and the President.

## GENERAL COMMENTS

As a very general comment it appears to the City that the impact statement has but cursorily addressed those issues which were discussed in the March 8, 1978 submission. Rather than investigate those problems, the impact statement has indicated that there are problems but makes no attempt to do more. Questions about impacts of the project are raised throughout the impact statement, but answers to those questions are meager.

One of the major contributing factors to the problems encountered in the environmental impact statement appears to be an overly close relationship between the applicant and the authors of the impact statement. The impact statement relies heavily upon Northern Tier for information as to impacts, mitigating measures, and other aspects of the environmental impact statement, rather than seeking independent knowledge, information, and expertise. Factual statements are made, which are not supported by documented evidence, other than indications that it is from the applicant. When documented evidence is presented, it is often incomplete or confusing. Examples of this situation are numerous, and some will be discussed below.

Because of these problems a brief review of the purpose of an environmental impact statement seems to be in order. An environmental impact statement is the "detailed statement" on environmental impacts of a project required by Section 102(C) of the National Environmental Policy Act. Such a statement must, "to the fullest extent," describe the impacts of a particular project, both those which are known and those which should be known. The statement must be an objective statement of those impacts, and should not discount or advance any particular position in regard to environmental impacts. The statement must contain a discussion of alternatives and mitigating measures meeting the same extent and standards as govern the handling of environmental impacts. Once all of this is accomplished in the statement, it forms the basis for decision making on the project which it addresses.

The statement thus does not meet the legal standards governing it, in two areas: 1.) it often indicates an impact, but does not "fully describe" what that impact will be, what alternatives are available to that impact, and what mitigating facts exist, if any. 2.) Much of the input, being derived from the applicant cannot be described as neutral, but must rather be presumed to be biased, and thus unreliable.

As noted, these general problems result in a myriad of specific deficiences in the document, which must be corrected, if the EIS is to serve its purpose.

## COMMENTS ON PARTICULAR IMPACTS

1. Energy

In the City's previous presentation, basic questions were raised as to severe potential impacts on the City's energy situation resulting from the Northern Tier Pipeline Project, as to the availability of power to serve that project. The EIS's discussion of impacts upon electrical power supplies is simply inadequate. The discussion, at pages 2-35 and 3-46, identifies the existence of a problem. Nowhere in the impact statement are mitigating measures suggested, nor is there a discussion of the job-producing potential of the project per unit of energy consumed with that of other industries, which might also seek to use the available power. Such would appear to be appropriate, due to the necessity to prioritize demands on energy.

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Listed below are some specific questions relating to this impact, which need to be answered in extensively greater detail than the impact statement presently does:

(a) How will Northern Tier's tanker unloading facility, on-shore tank farm, and pipeline system affect the availability of power to existing industrial, commercial, and residential consumers on the City of Port Angeles Light Department and Clallam County P.U.D. during periods of "operating" and/or "planning" shortages of power?

(b) What type of transmission line must be constructed to the tanker unloading facilities on Ediz Hook, and what will be the effects of that construction on the hook?

(c) What is the effect upon the estimates of electrical shortages of the recent rescheduling of target dates for commercial operation of the W.P.P.S.S. nuclear projects? This situation affects the "planning" shortages of power by widening the period in which the region's forecasted power load will exceed the region's electrical energy resources.

(d) If a diesel-powered emergency electrical generator is to be constructed at the berthing site, what are the environmental impacts of that construction, including air quaility and noise impacts:

(e) Will there be additional energy requirements if a shipload of oil requires reheating before it can be pumped through the pipeline system?

(f) At what rate may the City of Port Angeles charge Northern Tier for electrical service to it: thermal or hydroelectric?

(g) Will the City and the P.U.D. retain the authority to allocate power among various classes of users in the event of severe shortages?

2. Population Growth

The EIS's forecasts of population growth, in both phases of the project, are highly suspect, as they appear unrealistically low.

Thus, the statement presumes a large local component in the labor force for the construction of the project, without demonstrating from data on existing union membership in the local area that the presumed percentage of local workers can be factually substantiated. The lower the local workforce, the greater the impact upon all local services. The statement also suggests a workforce averaging 189, which seems ridiculously low in light of the total value of construction within the local area. The recent loss of the Hood Canal Floating Bridge must obviously be taken into account in determining the construction phase population, as the applicant and the impact statement makes the broad, unsubstantiated assumption that a large portion of the workers will be commuters. Without the bridge, that assumption must be subject to re-evaluation, even more than it was prior to the loss of the bridge.

The operation phase analysis of population growth includes only company employees, and ignores the probability of employment for provision of services to those persons, and other such secondary population growth.

3. Fire Protection

The subject of fire protection was one of vital concern in the 1978 comments, due to the large size of the tankers contemplated for use in Port Angeles Harbor, and the exposed nature of many public and private facilities to a fire and/or explosion at the marine terminal. The discussion of this area throughout the Impact Statement is superficial and does not adequately address the impacts of the proposal, nor are any measures suggested which could mitigate those impacts.

The statement gives a brief review of the fire protection facilities proposed by Northern Tier, but no assessment is made of the ability of those facilites to handle possible fire, or explosions. For example, the location given for the diesel-driven fire pumps to be installed near the booster pump platform does not evaluate the exposure of these pumps to damage or destruction by fire or explosion. These pumps should be located ashore, in pits or other protected locations, as close to water level as possible, rather than in vulnerable locations. Two separate pump locations are necessary with separate suctions, controls, and valves, so that either pump

CONT

may operate independently of the other, in case of damage or destruction. The necessary pump capacity has not been discussed, nor detailed descriptions or hydrants, fire mains, fire fighting chemical storage and locations and number of necessary fire appliances given for the berthing facility.

The Impact Statement does not address the necessity and method of implementation of fire fighting efforts between the City, the rural fire districts, and Northern Tier. In the event of a fire explosion, this would be a necessary element of the method of handling such problem.

Although the major portion of the March 8, 1978 counts on fire protection directed to the question of what impacts would result from a significant increase in the population of the City of Port Angeles, in either the construction or operation phase of the project, the impact statement makes no mention of this clearly relevant secondary-type impact.

4. Police Protection

Impacts on police protection were addressed at length in the 1978 submission. This impact as well as many others cannot be adequately addressed until an adequate forecast is made of the population increase during the construction phase and during the operation phase of the project.

During the construction phase, some of the specific impacts which can be identified and which are not adequately discussed in the Impact Statement are:

(a) What impact will traffic to and from the construction site, including workers and materials, have upon the existing streets, and what police problems will this cause?

(b) What will be the crime increase as the result of an influx of construction workers, whatever the number may be?

(c) What will be the impact upon the admittedly limited parking facilities existing on Ediz Hook , which is particularly a problem during the fishing season?

(d) What is the potential for sabotage, vandalism, and theft, when large quantities of materials will be stock piled on the Hook? This is particularly appropriate, as a recent experience with construction on the Hook has indicated a high incidence of vandalism and theft?

After the construction period, in the operation phase, there will be a permanent increase in the population of the City of Port Angeles. The impact of this increase upon the provision of general police services has not been discussed in the Impact Statement.

5. Emergency Services

This is a new concern to the City, not previously expressed. The concern here is that the Impact Statement does not address emergency procedures to be followed in the event of a fire or explosion, in addition to those impacts which such an event will have upon police and fire protection.

When looking at the impact such a catastrophe will have upon services other than fire and police, and upon the general population, this situation must be addressed. An emergency evacuation plan, which will provide for the removal to safety of persons who might be directly impacted by such an event should be discussed. Specifically included should be effects upon the lower section of the City and areas along the bluff. Impact from a shock wave can certainly be expected in these areas. A shock wave caused by explosion at the berthing facility would have no resistance between that facility and the downtown area. The shock wave also might not be affected by the 200 foot height of the bluff, as uplift from the surface front should be considered. The potential for damage to structures located in the downtown and along the bluff, including the only available hospital, industrial facilities, and a business district built on pilings should be evaluated.

Measures to mitigate the explosion and fire risk have not been discussed, other than an indication that fire protection facilities will be provided. Operational standards which might be used to mitigate this possibility are not addressed. The availability of the United States Coast Guard or probate agencies to provide and enforce operational standards should be included within the statement and a discussion of what those operational standards should be.

CONT

6. Economic Impacts

Discussed under this general topic are impacts related to costs to local governments to be incurred as a result of the project, and impacts upon the local economy from the project, including existing industry and tourism. These subjects were covered separately in the 1978 submission, but are addressed here in a more general manner. This is, in part, up to the failure of the Environmental Impact Statement to do more than raise questions in regard to impacts on the local economy.

Among the issues related to the genral topic of economics, are the following:

(a) Why does the impact statement not mention the Clallam County overall economic development plan, which is designed to identify and set priorities for reducing the county's unemployment rate? Any description of current social and economic conditions which does not take account of this plan is incomplete.

(b) Why does the impact statement not address the probability of future plans of existing industry beyond a general statement that "local economy is expected to grow"?

(c) Why does the statement assume that because the Olympic Air Pollution authority anticipates no new industry, new industry is not to be expected? There is a serious question as to the expertise of the Air Pollution Control authority to anticipate future industry.

(d) Why are impacts upon the tourist industry of the development, and of oil spills or other mishaps not addressed? The EIS refers to the effect of the 1969 oil spill on Santa Barbara, California tourism, but does not make any analysis of that impact, nor relate why that sample is similar to Clallam County. That particular set of data is not further related to subsequent years to demonstrate the long-term effect of the oil spill.

(e) As a particular example of the earlier statement that all the impact statement does is identify problems, why does the statement boldly comment that "fish production reduced by an oil spill could reduce the income of commercial and Indian fisherman. Additional work will be done to assess these losses when estimated of biological effects are completed"? This is an avoidance of the funcion of an EIS.

(f) Finally after noting that there will be increased costs in providing public services as a result of the project, why does the statement not attempt to analyze those costs, quantify them, provide for mitigation of the costs, or in other ways deal with the subject.

7. Transportation

This topic was earlier addressed, as it applied solely to the problem of City streets. However, the impact of the project is wider than previously discussed. The project will undoubtedly result in a significant increase in the use of the major highway in and out of Port Angeles, and in the City streets of Port Angeles. Additionally, the character of use of the streets may be significantly altered, through the transportation of heavy equipment and materials on those streets. The Impact Statement does not address, to any degree, the question of these impacts.

Among questions which the impact statement should address are the following:

A. What costs will be incurred by State and local governments for construction and maintenance of roads necessitated by the Northern Tier Pipeline Project?
B. Why is there not a plan discussed designating alternate or detour routes to be utilized during construction when roads area available or disabled?
C. Why does the impact statement assume a 1.5% per annum traffic growth rate for the Port Angeles area, rather than the 5.3% per annum growth rate established in the 1973 TOPICS study by Harstad and Associates?

CONT

D. Was mass transit movement of man power considered as a mitigatory measure?
E. What will be the frequency and type of vehicular traffic on Ediz Hook and in Port Angeles during construction and operation?
F. As the application indicates that large quantities of gravel and fill materials will be required for construction of the tanker facility, what impacts can be expected as a result of the necessity for such material? Included should be a description of all roads, dust control measures, traffic control measures, parking provisions, etc., associated with extensive hauls of materials.

8. Air Quality

As is noted in the March, 1978 submission, the impacts of the Northern Tier project on air quality is an issue of vital concern, for two reasons. The first is due to existing air quality problems in the Port Angeles area, and the effect that future deterioration will have on air quality. The second is what effect, if any, the Northern Tier Project will have on operation of presently existing sources of contaminants, which include the major employers in the Port Angeles area. Due to the significant nature of this impact, the number of questions surrounding the air quality analysis in the impact statement are many, and but a few of those are suggested in this presentation.

Many of the questions concerning this subject deal with the scientific methods used in the preparation of the air quality analysis and are too detailed to be addressed in this public hearing context. However, choosing but one example, the selection of Reid Vapor Pressure of 4.0 psi may be misleading as there is ample documentation showing 8-12 psi as a "typical" Reid vapor pressure. With oil being received with Reid vapor pressures substantially in excess of that figure assumed, vapor recovery systems should be considered at all appropriate locations.

Other questions concerning the air quality analysis deal with the opposite of scientific analysis deficiencies; the acceptance of vague unscientific generalities about impacts. Thus, the statement "clean air act standards for sulfur dioxide will will probably be exceeded about two days per year" is meaningless. "About two days" is useless in an attempt to analyze impacts. Precise definition of the expectation here must be considered, rather than crude estimates.

Finally, the statement refuses to consider certain circumstances which could lead to air quality impacts. The statement makes no analysis of the air quality impact resulting from an oil spill. In such a circumstance, 15% of the oil may enter the air within the first two hours after the spill. The impact statement further states that purging of the tankers will not occur in port, except in an emergency situation, and therefore, does not proceed to analyze the air quality impact, should such occur.

This dismissal of significant area of possible air quality impact is unacceptable. There is no statement which will indicate the source for the statement that purging will not occur in port. If safeguards are to be provided to prevent this, then they should be discussed. Further, assuming an emergency, the air quality effects of the purging should be discussed.

The "worst case" analysis contained in the impact statement is misleading, in that it is not actually a "worst case;" rather, smaller sizes of tankers than might be used and average meterological conditions are compared. The statement assumes that, because of the infrequency of maximum use of the berthing facilities and the worst meterological conditions, the simultaneous occurence of those two, and the resultant air quality impacts need not be considered. A true "worst case" analysis must be considered, rather than an analysis based upon average conditions.

9. Water Quality

Water quality is of great interest to the City. Once again, certain aspects of water quality have been ignored or down-played, rather than considered.

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9. (Continued)

As an example of this, the impact of discharging oil-contaminated wastewater from the tank farm is not openly discussed in the impact statement. There is a vague statement that air quality will be affected by large emissions of hydrocarbons if substantial portions of wastewater are processed. However, no discussion is made as to what happens to that wastewater. It is possible that up to 2,790,000 gallons per day of wastewater may be discharged at the tank site, to Siebert Creek. The impact of the discharge of this amount of wastewater into the creek should be discussed by the statement.

The statement further indicates that, in case of a major oil spill occurring in Port Angeles Harbor, the Clean Sound Cooperative will be used to clean up that spill. No indication is given, however, as to the abilities of the Clean Sound Cooperative to respond to an emergency in Port Angeles, the capabilities of Clean Sound Cooperative in response to an oil spill here, or what steps should be taken, if necessary, in addition to utilization of Clean Sound Cooperative.

10. Utilities

Concerns are manifest concerning the impact of the Northern Tier Project upon the City's provision of utility service to its existing customers, and increased demands due to the Northern Tier project. These concerns should be addressed in the impact statement, so that impacts are identified, and minimized. Once again, however, little is done by the impact statement to analyze this area.

Some of the questions which have arisen concerning impacts on utilities, which are unanswered by the impact statement, are as follows:

A. What are the fresh water requirements of the Northern Tier Project? There is no indication in the impact statement as to whether fresh water will be required for fire protection, ballasting of vessels, or for any other uses.

B. What source of supply can be suggested to supply the water demands, assuming that they are high for ballasting or fire protection. purposes?

C. What method will be used to dispose of sanitary sewage? Flowing from that question, are the questions of, assuming holding tanks for the facility and tankers, how will they be pumped, what method is proposed to dispose of the material once placed in to the holding tanks, and what will be the impact of this upon the City's sewage treatment plant, if its use is contemplated.

D. What is the capability of the present water line upon Ediz Hook, and what changes will be required in that water line, if its use is contemplated.

E. Since Port Angeles does not provide waste treatment for industrial or hazardous wastes, what method of disposal of those wastes is contemplated?

F. What arrangements or method is contemplated for disposal of solid waste generated during the construction of the project? There is no indication that such will be generated, and no indication of how it will be disposed.

11. Wildlife and Plant Life

Diverting completely from impacts upon the City of Port Angeles as a municipal corporation, whether earlier expressed or presently discussed, the treatment in the EIS of many other areas, including, for expample, wild life and plant life, is subject, generally, to the same type of deficiencies, as have already been discussed at length. A brief discussion of these impacts occurs here, to demonstrate the breadth of the impact statement's problems.

Thus, as has been noted often before, the statement uses generalistic words, such as "probably" and "generally" to describe impacts upon wildlife and plant life. This is unacceptable, when detailed data is available from which specific analysis can be made. As an example, there are approximately 1,450 established and defined species of vascular plants on the Olympic Peninsula. The impact statement mentions but 50 of these species. Impacts

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upon all of those species can be expected, rather than upon the 50 that are discussed.

The statement does not discuss impacts upon species other than as can be expected from construction of the facility. No discussion occurs as to the impacts upon species of either oil spills or air pollution. These impacts are as real to the plants as to any other element of the environment.

These examples of the method in which effects upon plants are considered applies equally well to the effects upon animals. Thus, the statement identifies only a few bird species present in the area to be affected, when a definitive analysis of the water fowl found in this area, including the Dungeness Spit, indicates an extensive number of species may be found in this area. Further, no consideration whatsoever is given to the migratory habits of these species, and how operation of the oil port will effect them,

## CONCLUSION

Upon a brief review of the materials already contained in this statement, it is obvious that many areas of concern have not been addressed at all - oil spill problems, displacement of local industry timber-rafting areas within the harbor, displacement of recreational facilities presently located at the Northern Tier site, and others. The lengthly list of impacts discussed in this statement was arrived at in but two to three days review of the environmental impact statement, and materials developed to date, by the author of this statement. Scientific and expert review were not involved in reaching today's statement. There are undoubtedly many more questions about the impact statement which would be raised, given a more extensive review, including scientific and expert invesitgation.

The brevity and lack of depth of the investigation which has produced materials included in this statement commenting on the EIS only emphasizes the City's position that the EIS has but cursorily addressed the majority of the impacts resulting from the Northern Tier Project. In this light, the City again requests that the BLM Impact Statement perform its statutory duty to fully analyze the environmental impacts of the Northern Tier application.

While the City recognizes the hardship of the time frame pushed upon BLM in which to prepare the impact statement, that circumstances does not relieve the impact statement of its statutory duty to fully disclose and analyze all evnironmental impacts. Unless that duty is performed by the impact statement, it does not fulfill the purpose for which it is designed.

Respectfully submitted,

CRAIG L. MILLER
City Attorney for
CITY OF PORT ANGELES

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King County,
State of Washington
John D. Spellman, County Executive

Department of Planning and Community Development
John P. Lynch, Director
C205 King County Courthouse
516 Third Avenue
Seattle, Washington 98104
[redacted]

March 30, 1979

Bureau of Land Management
729 N.E. Oregon St.
Portland, OR 97208

Gentlemen:

Attached are the comments of King County related to your Draft Environmental Impact Statement on "Crude Oil Transportation System". These detailed comments were prepared by my department and we will be happy to respond to questions at 206-344-7503.

Sincerely,

John P. Lynch
Director

JPL:dja

Attachments

King County appreciates the opportunity to present its detailed comments on the Bureau of Land Management's Draft Environmental Impact Statement. While the draft is comprehensive in its approach, much more thorough analysis on several points is necessary. We hope these comments will aid in making the final impact statement a comprehensive and detailed analysis of a major proposal affecting the environment.

① 1. River Crossings (Pages 1-44, 4-2, and 5-16). Given that the salmon resource of the Puget Sound Basin is already jeopardized and is one of Washington's greatest natural resources, the discussion of an action that threatens further damage to this resource for up to 20 years is inadequate. The Draft EIS assumes that the impact will occur. No alternatives to trenching, dredging and blasting a river bottom are listed. What about going over the river or directional drilling?

② 2. Federal Policy. On Page 1-59, the DEIS fails to mention policies in the Utility Regulatory Act which require consideration of supplying the refineries in Northern Puget Sound (See Page 48, Section 507.2A and Page 108 of the Act). The Washington State Coastal Zone Management Program is mentioned, but not described. No mention is made of Secretary of Transportation Adams' rule limiting tanker size to 125,000 dead weight tons east of Port Angeles. Both these policies are important and should be mentioned.

③ On Page 1-61, the text states that the Marine Mammal Act prohibits tankers greater than 125,000 dead weight tons. This is incorrect. It limits the siting of any transshipment port to, at or west of Port Angeles, and limits expansion of existing refinery docks unless expansion is for the purpose of serving the State of Washington's consumption needs.

④ 3. Environmental Inspector (Page 1-46). While there is mention of an environmental inspector, to be hired by Northern Tier, there is no discussion of how many there would be per pipeline mile during construction, nor what their authority would be. These inspectors should have the power to stop work. The Federal Government or State should have stipulated agreements that assure other mitigating measures will be taken. Since it would most likely be the environmental inspector who would implement stipulated agreements, these inspectors must be hired independently, even if they are ultimately paid by Northern Tier.

⑤ 4. Ground Water. The discussion of possible effects of an oil spill on ground water is limited to one quarter of one page (Page 2-63) and to general discussion on Pages 3-67-70. This

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⑤ general and limited discussion, together with the applicants failure to note water supplies no farther from the pipeline than one mile in its application, is haphazard treatment of ground water. The general discussion given on Pages 3-67-70 should be made specific to sites in western Washington where an oil spill might potentially contaminate ground water. Where the pipeline is below the water table, a thorough treatment of possible alteration in drainage should be provided.

⑥ 5. Fishery Resource. The fishery resource within major rivers to be crossed is discussed but there is no discussion of this resource within smaller creeks and rivers. Some of these creeks and smaller rivers are important. The Table on Page 2-82 does not include any figures for the South Fork of the Snoqualmie. Are there no Chinook, Coho, Pink, Chum or Sockeye in the Snoqualmie? What about Steelhead? No approved fish windows are given. From the charts on Pages 2-83-87, it is difficult to conclude that there would ever be a safe time for crossing rivers in King County. Finally, figures are available on the value of these aquatic resources for each river. These values should be listed.

⑦ 6. Habitat Impact. Tables on Page 3-29 listing various habitat impacts are meaningless or at least of little help. The DEIS should detail some examples of what has happened in places like the Inland Sea of Japan. The Inland Sea is similar to Puget Sound in many ways. Some 2 million imperial gallons of heavy bunker C fuel oil entered its waters December 18, 1974. Members of local fish cooperatives reported 30,000 fish killed and 110,000 of 120,000 nets destroyed. In 1975, the fish crop was 10% of normal and the Japanese Government closed all marine ship markets in the area. Clean up costs in 1976 were close to $200 million. (See "The Mizushima Oil Spill - a Tragedy for Japan and A Lesson for Canada", Environmental Impact and Assessment Report, EPS-8-EC-76-2, Environmental Conservation Directorate, October 1976.)

⑧ 7. Fuel Barges (Page 3-42). "... fuel barges from Puget Sound ports would be required in about the same numbers (395 calls per year without hookup of the refineries in northern Puget Sound), and the demand for bunker fuel could generate additional tanker or barge traffic from California to Port Angeles or Puget Sound bulk terminals." (parentheses added) This statement is confusing. We understand that fuel barges will call at Port Angeles to fuel tankers. What is not clear is where this traffic is coming from. How many of the 395 barges would come from California? How many would be tankers versus barges? How much barge tanker traffic exists now and what percentage increase is likely?

⑨ 8. Spill Liability (Page 3-51). If a spill occurs, who pays for the cleanup -- Local Government, State, Federal Government or applicant? What laws affect the assignment of liability? There is no discussion of this subject in the DEIS. There is mention of two industry funds. One is "Tanker Owners Voluntary Agreement Concerning Liability For Oil Pollution" (TOVALOP). The other is "Contract Regarding An Interim Supplement To Tanker Liability For Oil Pollution" (CRISTAL). Both are for tanker incidents, not pipelines, and would provide potentially $40 million in relief, which is far below the actual cost of cleanup. Only the Trans-Alaska Pipeline Liability Fund would provide substantial relief, but again, only in case of a tanker accident, not for a pipeline rupture.

⑩ 9. TOPOGRAPHY. On Page 3-59, the statement is made: "Overall impacts of topography would be relatively minor except in the more mountainous regions". (emphasis added) What does "relatively" mean in this case, e.g. to a railroad corridor, BPA corridor, or highway? Since King County encompasses the more "mountainous regions", we are concerned about the visual impact of the corridor from North Bend to Snoqualmie Pass. The DEIS has little to say about mitigating visual impacts and virtually neglects to detail what won't be "relatively minor" impacts in the more mountainous
⑪ regions. What stipulations can the Forest Service make in this

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⑪ area? What are the "extensive measures" government agencies are to use (Page 5-19)? Can tentative access road entrances for construction and operation be indicated? What kind of vegetation will be used? How much widening of existing BPA and railroad corridors will occur? Where would this widening occur, and is it necessary? A 90 foot corridor is planned, yet this is much larger than the fifty foot corridor required along the Trans-Alaska Pipeline route. Is 90 feet really necessary?

Since this area from North Bend to Snoqualmie Pass is predominantly national forest and of high recreational and visual value, what serious mitigating measures are under consideration or should be?

⑫ 10. Geologic Hazard (Page 3-61). At several locations along either the proposed route or the cross Sound route, seismic, liquefaction and land slide hazards exist. Virtually nothing is said of how to give extra protection to the pipeline in these areas in order to prevent rupture and oil spillage. Better baseline data on soils should be collected by Northern Tier, and BLM should consult with local geologists in order to derive a list of mitigating and preventive measures in risk areas.

⑬ 11. Leak Detection System (Pages 3-65-66). The applicant has stated that its leak detection system will not detect leaks less than .5% of capacity per day. Assuming a flow of 709,000 barrels per day (b/d), 3,540 b/d could spill undetected. Observation flights will be made every two weeks. It is possible, then that 3,540 b/d could spill undetected for 14 days, or a total of 49,560 barrels or 2,081,520 gallons, assuming the pilot spots the spill on his flight. Such spillage would be serious in Western Washington's environment. While such spillage is unlikely, there is a critical need for detailed observation of the pipeline during the first year of its operation at least. The provision of line flyers every two weeks is not adequate.

While it is mentioned that an oil spill contingency plan must be developed before permits are given, there is little said about what this plan must provide. Will there be response teams organized? Who will they include -- Local Government employees, State or Federal employees, private or a combination of all four? How much training will they have? What are the techniques for cleaning up land spills? What types of equipment are necessary? What agency has the main coordination responsibility? Where has coordination been weak in other plans that have been used?

⑭ 12. Marine Oil Spill (Page 4-3). The mitigation measures for a marine oil spill include the applicant providing booms, the applicant's membership in Clean Sound Cooperative and the provision of a skimmer at Port Angeles. The number and length of oil booms should be listed as well as the resources in equipment and personnel of Clean Sound Cooperative. With the Inland Sea of Japan Spill, 200,000 people, 300 aircrafts, 38,000 boats and 24,000 meters of boom were used to contain 2 million gallons of heavy oil. (See "The Mitzushima Oil Spill - a Tragedy for Japan and A Lesson for Canada", Environmental Impact and Assessment Report, EPS-8-EC-76-2, Environmental Conservation Directorate, October 1976.) Skimmers and booms as the DEIS points out are ineffective in moderate to high seas. Only preventive measures can hope to minimize the impact of a major spill. Why is there no mention of safe queuing procedure, safe harbor alternatives, requirements for improved technical navigating equipment on board ship, and restricted port entry times in case of foul weather? For instance, with certain visibility or rough sea, entry to the Straits of Juan de Fuca might be allowed only on an outgoing tide. The Coast Guard has almost unlimited power in regulating tanker movement, yet there is no discussion of alternatives available to them.

There is mention on Page 4-3 of the VTS-3 System. A thorough description of the system is not given. Public comment might be able to suggest improvements if the system were detailed.

The best preventive measures are those that force ships to operate in the most favorable conditions or take advantage of natural forces to limit the expansion of any oil that does spill. What are those measures?

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⑮ 13. Erosion and Soil Productivity Loss. On Pages 5-13 and 5-16, soil erosion rates and productivity losses are given. Like the treatment of geologic, liquefaction and landslide hazards, little is said about mitigating these rates nor what the actual impact is. The DEIS says that during operation, soil erosion will increase from .10 tons per acre per year to .34 tons. What does this mean in qualitative terms? Western Washington presently experiences a non-point source water pollution problem due to construction of logging roads, logging and other development activities. Does this increase in soil erosion contribute significantly to this problem? So little is said in the mitigation section of the DEIS about vegetative cover that the reader is left without any knowledge for the alternatives that would mitigate erosion.

⑯ 14. Regional Energy Demand. On Page 5-22, it is stated that Northern Tier will cause a 5% increase in demand on the BPA transmission grid. What does this mean for BPA reserves, increased probability of industry shutdown, need for additional thermal plants in how many years, and energy projections? What power companies are affected -- Tacoma City Light, Puget Power, Clallam County PUD? What, if any, conservation measures can be taken by Northern Tier?

⑰ 15. Analysis of Oil Spills on Land. Except for the mention of a study by the University of Alberta on Page 5-15 concerning the effect of oil spills on soils, and a half page (Page 3-66) on a study of 53 spills in Alberta, the DEIS does not present a thorough statistical study on the causes of pipeline spills nor the history of past spills and their magnitude in the United States or world. Such figures and analysis are important in order to judge which is the safer mode of transporting oil -- pipelines or tankers. Some descriptive analysis as well of previous spills on large pipelines would be valuable instead of the predictive statistical method presented. How many barrels per pipeline mile in the United States have been spilled in the last five or ten years? What were the causes of the spills? How were they detected? Did leak detection systems work and live up to their predicted reliability? How much disturbance occurs in cleaning up spills? (Mentioned is made of the 1973 Transmountain Pipeline Company spill and that recovery was total. This spill did not occur in a mountainous zone, at least not like the one between North Bend and Snoqualmie Pass. What would have been the possibility and impact of cleanup had the 1973 spill occurred near North Bend or Snoqualmie Pass?)

⑱ 16. Cross Sound Route (Page 8-3). In light of the applicant's serious consideration of the cross Sound route alternative, the alternative section should be expanded to detail impacts of this route and the economic feasibility of hookup. As we understand it, the main reason for going cross Sound is to reduce the tariff cost of a spur line supplying the refineries at Cherry Point and Anacortes so that it will be competitive with tanker costs from Port Angeles to Cherry Point and Anacortes. BLM should analyze on what cost basis -- rolled in or marginal -- the Federal Energy Regulatory Commission would set the spur line tarrif. What is the difference in tariff if Northern Tier goes across the Sound instead of around?

⑲ 17. North Puget Sound Port Sites. The statement is made on Page 8-3 that use of Cherry Point would cause "less environment impacts from oil spills than in the area of Port Angeles and Green Point". This statement is incorrect. The greatest marine resources and recreational resources lie in northern Puget Sound. (See the Washington State Oceanographic Commission Report, "Offshore Petroleum Transfer Systems for Washington State".)

On Page 8-28, the statement is made that vessel traffic congestion would be no problem for the Burrows Bay port alternative. This is hard to believe, since Burrows Bay lies just east of the major shipping lane crossroads of Puget Sound.

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Generally, the discussion of alternative port sites leaves the reader with the impression that greater damage would occur with a port at Port Angeles than one to the east. Every study to date and every legislative policy, whether State or Federal, has concluded just the opposite. If BLM disagrees with these past studies and policies, then it should state the basis of its disagreement clearly.

## REMARKS OF THE KING COUNTY EXECUTIVE AT THE BLM PUBLIC HEARING REGARDING THE NORTHERN TIER PIPELINE PROJECT

March 14, 1979

ON BEHALF OF KING COUNTY EXECUTIVE, JOHN SPELLMAN, I APPRECIATE THE OPPORTUNITY TODAY TO DISCUSS SEVERAL IMPORTANT ISSUES REGARDING THE PROPOSED NORTHERN TIER PIPELINE PROJECT AND THE BLM DRAFT EIS. I WILL BE SUBMITTING IN THE NEAR FUTURE A DETAILED CRITIQUE OF THE DRAFT STATEMENT.

THE KING COUNTY EXECUTIVE BELIEVES THAT CRUDE OIL TANKER TRAFFIC ON PUGET SOUND BE KEPT TO A MINIMUM. THE ECONOMIC AND NATURAL RESOURCES OF PUGET SOUND ARE TOO VALUABLE LOCALLY AND NATIONALLY TO RISK SEVERE DAMAGE FROM A MAJOR OIL SPILL DUE TO A TANKER ACCIDENT.

WASHINGTON'S DEMAND FOR CRUDE OIL IS EXPECTED TO DOUBLE BY THE YEAR 2000, REQUIRING MORE TANKERS AND RESULTING IN GREATER RISKS FOR THE PRODUCTIVE WATERS OF PUGET SOUND.

WE HAVE VIEWED THE NORTHERN TIER PROJECT AS A POSSIBLE WAY TO REDUCE THIS RISK SINCE PUGET SOUND REFINERIES COULD POTENTIALLY RECEIVE CRUDE OIL VIA A SPUR PIPELINE INSTEAD OF TANKER. IF THIS "HOOK-UP" WERE ACHIEVED, TANKER TRAFFIC THROUGH THE MOST DANGEROUS WATERS OF PUGET SOUND COULD VIRTUALLY CEASE.

WE HAVE WITHHELD FINAL JUDGEMENT ON THE PROJECT HOWEVER, UNTIL MORE IS KNOWN ABOUT THE ENVIRONMENTAL IMPACT OF THE PIPELINE. OUR OWN REVIEW HAS RAISED QUESTIONS ABOUT WHETHER NORTHERN TIER AND THE FEDERAL GOVERNMENT HAVE, AS YET, MADE EVERY EFFORT TO ENSURE THAT THE MOST ENVIRONMENTALLY SOUND PROJECT IS BUILT.

⑳ FOR EXAMPLE, NORTHERN TIER IS PRESENTLY ANALYZING A CROSS SOUND ROUTE FOR ITS PIPELINE INSTEAD OF THE PROPOSED AROUND THE SOUND ROUTE. YET, THE DRAFT IMPACT STATEMENT FAILS TO ADDRESS KEY TECHNOLOGICAL PROBLEMS OF SUCH A CROSSING; PROVIDING ONLY A DESCRIPTION OF THE ROUTE AND OIL SPILL TRAJECTORY. WE NEED TO KNOW WHETHER THE PIPELINE WILL BE DOUBLE WALLED OR WHETHER WATER PRESSURE WILL HOLD OIL IN THE LINE IF THE PIPE RUPTURES.

ONE OF THE MAIN REASONS FOR A CROSS SOUND ROUTE IS TO MAKE SUPPLY VIA PIPELINE OF THE REFINERIES AT CHERRY POINT AND ANACORTES MORE ECONOMICALLY FEASIBLE. BOTH THE COASTAL ZONE MANAGEMENT PROGRAM FOR WASHINGTON AND THE UTILITY REGULATORY ACT OF 1978 ENVISION HOOKUP AS THE WAY TO REDUCE TANKER TRAFFIC ON PUGET SOUND.

CONT

YET THE ECONOMIC ABILITY OF THE REFINERIES TO RECEIVE CRUDE OIL VIA A SPUR LINE REMAINS IN DOUBT. IF THE PUBLIC IS TO EVALUATE THE PROBABILITY OF HOOKUP, IT IS IMPORTANT TO CLARIFY HOW THE APPROPRIATE TARIFF FOR THE SPUR LINE IS TO BE ESTABLISHED. WHAT POLICIES WILL THE FEDERAL ENERGY REGULATORY COMMISSION FOLLOW IN SETTING A TARIFF? WILL IT AGREE TO USE A "ROLLED-IN" COST BASIS OR A MARGINAL COST BASIS? DOES EITHER COST BASIS MAKE A DIFFERENCE IF THE ROUTE IS CROSS SOUND? WHAT IF THE ROUTE IS AROUND THE SOUND?

ANOTHER CRITICAL CONCERN FOR KING COUNTY IS RIVER CROSSINGS. THE DEIS OFFERS ONLY ONE WAY TO CROSS A RIVER - - DREDGING AND BLASTING. THERE ARE OTHER POSSIBLE TECHNIQUES WHICH SHOULD BE THOROUGHLY DISCUSSED IN THE EIS. IF IT IS POSSIBLE THAT AN IMPORTANT SALMON RUN WILL NOT RECOVER FOR TWENTY YEARS AS THE DEIS SAYS, THEN WE OUGHT TO BE FINDING WAYS TO CROSS RIVERS WITHOUT RISKING THE FISH.

㉑ A THIRD MAJOR CONCERN WE WOULD MENTION, AND WHICH THE DEIS NEGLECTS TO TREAT, IS THE POTENTIAL FOR ASSOCIATED OIL DEVELOPMENT AND ITS IMPACT ON THE PUGET SOUND BASIN. A THOROUGH ANALYSIS SHOULD BE PREPARED ON WHETHER THE ECONOMICS ARE FAVORABLE FOR THE ESTABLISHMENT OF PETROCHEMICAL PLANTS OR OTHER REFINERIES IN THE PUGET SOUND BASIN. THIS POSSIBILITY CONCERNS US BECAUSE SUCH DEVELOPMENT HAS THE POTENTIAL TO SEVERELY AFFECT THE QUALITY OF LIFE IN OUR REGION. WE SHOULD KNOW AS EARLY AS POSSIBLE WHETHER SUCH DEVELOPMENT IS REALISTICALLY THE NEXT STEP.

ONE MORE EXAMPLE WILL SUFFICE TO INDICATE OUR FEAR THAT ALL REASONABLE STEPS NECESSARY TO PROTECT OUR ENVIRONMENT HAVE NOT BEEN CONSIDERED. ONE OF THE QUALITY CONTROL TECHNIQUES USED IN BUILDING THE TRANS-ALASKA PIPELINE SYSTEM WAS THE ENVIRONMENTAL INSPECTOR WITH AUTHORITY TO STOP WORK IF NECESSARY. ANOTHER WAS THE USE OF STIPULATED AGREEMENTS. WELL BEFORE PERMITS WERE ISSUED, THE FEDERAL GOVERNMENT NEGOTIATED STIPULATED AGREEMENTS WITH ALEYSKA PIPELINE COMPANY. THESE AGREEMENTS DETAILED WHAT COULD AND COULD NOT BE DONE TO THE ENVIRONMENT OF ALASKA. AS A FURTHER PROTECTION, THE ENVIRONMENTAL INSPECTOR HAD AUTHORITY TO STOP WORK IF VIOLATIONS OCCURRED. WE HAVE SEEN NO EVIDENCE THAT THE FEDERAL GOVERNMENT IS WILLING TO NEGOTIATE AGREEMENTS FOR THE PROTECTION OF WASHINGTON'S ENVIRONMENT, AND NO WHERE DOES THE DEIS SAY THE ENVIRONMENTAL INSPECTOR WILL HAVE STOP WORK AUTHORITY. THE LACK OF THESE TWO ELEMENTS SEEMS TO INDICATE A DESIRE TO RUSH TOWARD THE COMPLETION OF THE PROJECT, LEAVING LOCAL GOVERNMENTS WITH THE IMPACTS TO BEAR.

I HAVE MENTIONED ONLY FOUR OF OUR MAJOR CONCERNS. OTHERS ARE INCLUDED IN OUR MORE DETAILED COMMENTS. AGAIN, I WOULD EMPHASIZE THE NEED FOR CANDOR FROM THE OIL COMPANIES AND MORE ANALYSIS FROM THE BUREAU OF LAND MANAGEMENT ON THE QUESTION OF HOOKUP. THE

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PROJECT WOULD SEEM CONSIDERABLY MORE WORTH THE ENVIRONMENTAL RISK IF THERE WERE AN AGREEMENT BETWEEN THE PUGET SOUND OIL REFINERIES AND NORTHERN TIER SO THAT CRUDE OIL WOULD ARRIVE AT CHERRY POINT AND ANACORTES VIA PIPELINE.

THANK YOU FOR YOUR ATTENTION.

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State Historical Society
of north dakota

March 29, 1979

State Director
Bureau of Land Management
Post Office Box 2965
Portland, Oregon 97208

Re: Draft Environmental Statement - Northern Tier Pipeline

Dear Sir:

In accordance with Section 106 of the National Historic Preservation Act of 1966 (80 Stat. 915, 16 U.S.C. 470), Executive Order 11593, "Protection and Enhancement of the Cultural Environment" (36 FR 8921, 16 U.S.C. 470), Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800), the National Environmental Policy Act of 1969 (83 Stat. 852, 42 U.S.C. 4321) or Office of Management and Budget Circular A-95, the North Dakota State Historic Preservation Office (State Historical Society of North Dakota) has reviewed the project referenced above.

Generally, this office was favorably impressed with the document as a whole and would appreciate seeing similar quality of design, approach, organization, clarity, editing, and reproduction in other documents of like purpose.

Specifically regarding the sections which present, identify, evaluate, discuss, analyze and otherwise consider cultural resources, impacts thereto, potential loss and mitigation procedures for the loss thereof, our general impression is also favorable. Although we could be happier with more thorough identification, evaluation, and impact analysis of cultural resources in North Dakota, it is the opinion of this office that given the current levels of project planning, cultural and paleontological resource surveys/research and available cultural resource contractors, the type of generalized analyses and discussion is neither inappropriate nor unacceptable. It is the further opinion of this office that the document satisfactorily addresses our immediate concerns with it's recognition of issues, potential problems, and likely impacts and with it's proposed solutions, remedies and protective procedures.

Our review did, however, note a few, mostly minor, details that we bring to your attention in the following comments and recommendations:

① 1.) Section 1.4 (page 1-57) item 8 - refers to " . . . areas of high archaeological potential." As it stands, the statement is somewhat misleading by its failure to define "archaeological potential" as including the more comprehensive range of cultural resources. This definitional problem is clarified in Section 2.1.2.10 and we recommend that the wording at page 1-57 either be more precise or else reference the definition at Section 2.1.2.10.

② 2.) Section 2.1.2.10 (page 2-103) 2nd column; 2nd paragraph - references the National Register of Historic Places of February 7, 1978. We recommend that in the final document you update the reference to February 6, 1979 and update the appropriate tables accordingly.

③ 3.) Table 2.1.1.10-2 (page 2-112) - Fort Buford State Historic Site, Williams County, North Dakota, is listed in the National Register of Historic Places. We mention this only because it lies in the immediate vicinity of Fort Union National Historic Site and because Alignment Sheet 19 does not clearly show the relationship to the proposed right-of-way to the Fort Union site. This is an extremely sensitive historic area and you should use great caution in planning the route through it. Also please be aware of the Bodmer Overlook area north of, and part of the planned development for, the Fort Union site.

④ 4.) Along the same lines, we recommend that you consider an update of all the cultural resource identification listings to reflect cultural resource inventory work since the reported data was compiled.

⑤ 5.) Section 4.10 (page 4-5) 2nd column, 4th paragraph - we note with interest the reference to Washington State's cultural resource protection legislation and advise you that North Dakota also has similar protective laws. (See: North Dakota Century Code, Chapters 55-03 and 55-10.)

6.) This agency's acceptance of the adequacy of the document and our continued support thereof is primarily dependent on the provisions of the proposed Memorandum of Agreement among the Advisory Council on Historic Preservation, Northern Tier Pipeline Company and the several State Historic Preservation Officers of affected states. Should that Agreement fail ratification or be substantially changed, this office would desire to reassess the adequacy of this document's analysis of the project's potential impacts on cultural resources.

If you have any questions regarding the above referenced project please contact Mr. Walter L. Bailey of our staff at (701)224-2672.

Sincerely,

for
James E. Sperry
State Historic Preservation Officer
(North Dakota)

JES/je
cc: Clearinghouse

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STATE OF
WASHINGTON
Dixy Lee Ray
Governor

DEPARTMENT OF FISHERIES

April 2, 1979

Bureau of Land Management
700 Northeast Multnomah
Room 2050 Lloyd Building
Portland, Oregon 97232

Attention Northern Tier DEIS

Gentlemen:

Review of the Federal Draft Environmental Impact Statement for Northern Tier Pipeline Corporations Proposed Oil Transhipment Facility (April 1979)

The Draft EIS for Northern Tier Pipeline Corporation has been reviewed by the Washington State Department of Fisheries. Our comments follow.

The Draft EIS in general provides insufficient information on the salmon, shellfish, marine fish, and the harvest of these resources in the State of Washington. The information that is contained in the Draft EIS is written and organized in a form designed to be readable for the general public. There is insufficient information however on the very important foodfish and shellfish resources of the State for decision-makers who must make the ultimate decision concerning the proposal. We recommend that the more technical information required by these decision-makers be contained in a technical appendix to the Environmental Impact Statement. This may provide the type of in-depth information required and still maintain a readable document for the general public. It is imperative that the technical information be included somewhere so that informed decisions can be made with full knowledge of the value of the resources involved.

It should be noted that the review presented herein is the first one Department of Fisheries has attempted of the Northern Tier Pipeline Proposal. The Department of Fisheries will be continuing to participate in the State evaluation of this project. Undoubtedly, some issues not addressed in this present review may become evident as the evaluation progresses. This present review does not preclude further additional concerns if they develop.

① We have divided our comments into two types. The General Comments which follow next concern a number of broader topics. They cover a number of omissions and/or errors in the text and were organized in this manner to avoid repetitious mention of these issues. The Specific Comments contained herein point out some of textual items to which the General Comments apply.

General Comments: Clams

Commercial clam farming is an important activity in the Dungeness area, in Sequim Bay, Discovery Bay, Dabob Bay, Oakland Bay, Little Skookum Inlet, Totten Inlet, and Eld Inlet. Recreational harvest occurs on public beach tracts in Dungeness, Sequim Bay, Hood Canal from Quilcene to Belfair, Oakland Bay, Totten Inlet, and Eld Inlet. All species of clams, including geoducks but not razor clams, are harvested either commercially or recreationally from intertidal or subtidal beds in or adjacent to these areas.

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As with other species, the yearly landings and harvest values (listed in our April 4, 1978 letter) for commercial and recreational harvest throughout the pipeline route should be included in the EIS. Being among the more impactable species, clams merit particular attention in the EIS.

As with marine species, clams have vulnerable spawn, planktonic larvae and seed. An aspect of their life history of particular note is the fact that native species of clams do not reproduce successfully every year but instead the population is sustained by periodic massive sets followed by a number of years of light setting. A massive kill on any one bed or in all beds in a discrete area could be expected to have long term effects until pollution is removed from the substrate and until a significant natural set occurs. Some intertidal beds could be rehabilitated by cleaning or replacement of the substrate and acquiring seed from shellfish hatcheries, while others such as geoduck beds would be difficult if not impossible to fully rehabilitate.

As with oysters, the duration of toxicity and tainting, the quantified effects of small frequent spills and large catastrophic ones, and the effects of historic spills all need further elaboration. The fact should be pointed out that some of the most intense clam (and oyster) farming occurs in sheltered semi-closed bays and estuaries where flushing is poor and potential impact the most devastating. Specific effects of historic spills in such locations should be discussed. Long lasting construction impacts on intertidal and subtidal clam populations have occured where substrate has been altered significantly during backfilling operations leading to siltation and smothering of adjacent clam populations and destruction of the habitat within the project area.

General Comment: Crabs

Dungeness crabs are important both commercially and recreationally in the Strait of Juan de Fuca from Port Angeles throughout Admiralty Inlet and recreationally in Hood Canal. During spring and early summer Dungeness crab move into shallow water to molt and to breed. During this part of the year they are commonly found in shallow bays such as Dungeness and Sequim Bays and on the deltas of rivers and large creeks flowing into Hood Canal. Most areas where eel grass is abundant and where the bottom is sand or sandy mud are considered prime habitat during part of the year. During the remainder of the year they are found in deeper water from about 30 to 300 ft.

Red crabs (Cancer productus) are common in both shallow and deep water from Port Angeles throughout Hood Canal and all the bays including Budd Inlet. They are important recreationally but so far not commercially due to their smaller size. Their prime habitat tends to be in rocky and gravelly substrate but they are also found in deep water on mud bottoms.

Any oil spill that coats eel grass, rock or gravel or becomes incorporated in the sediments can be expected to degrade the habitat or reduce the food supply of both species of crabs commonly harvested. Tainting and increased susceptibility to disease merit discussion as well as direct toxicity and smothering of crabs. Harvest rates and values should be listed in the EIS by area.

General Comments: Groundfish

1. Harvest

Puget Sound, the Straits of Juan de Fuca and the North Sound area provide important commercial and recreational harvests of groundfish or bottomfish. Neah Bay, the San Juan Island area and Tacoma Narrows are well known recreational bottom fishing areas. Tacoma Narrows and central Puget Sound in the vicinity of Agate Pass support an intensive fishery for Pacific cod. Recreational effort for bottomfish has been increasing 10-15% each year (Bargmann, 1977).

The types of gear fished commercially and the target species are listed by area in Table 3. The annual harvest figures and dollar values detailed by area in the Appendices of the Washington Department of Fisheries April 4, 1978 letter should be included in the EIS.

2. Life History and Operational Impacts

Several aspects of groundfish life history are worthy of particular note. These species have valuable planktonic eggs and larvae. Many adult groundfish, particularly flounder, sole and lingcod, spend a considerable portion of their time in direct contact with the sediments. They constitute the group of finfish most vulnerable to impact due to change in subtidal sediments. The potential for tainting of these species and increased susceptibility due to the portions of oil spills which sink should be discussed. This discussion should include an historical look at this problem in other areas of catastrophic and/or chronic oil pollution. The potential for impact on the harvest from these effects should be explored along with the effect of the direct curtailment of fishing due to potential contamination of gear.

General Comments: Herring

a. Life History

Herring are intertidal to shallow sub-tidal spawners. They deposit their eggs on eelgrass and other vegetation located at tidal elevations from approximately + 3 to - 15 feet. After hatching the larvae are planktonic. Herring are exceedingly important in the food chain in Puget Sound waters. Many species including salmonids feed on herring and other baitfish throughout the Sound.

b. Commercial Fishery

Commercial fishing for herring is primarily composed of three types. The sac-roe fishery is permitted in northern Puget Sound during spawning when sufficient spawners are present. The fishery is of very short duration and is exceedingly intense. Gill net and purse seine gear is used to harvest sac-roe herring. The second type of fishing which occurs for herring is the bait fishery. The bait fishery is fundamental to recreational salmon and bottom fishing in Washington State. The bait fishery is conducted in Hood Canal and south Puget Sound. Lampara and dipnets are used for this harvest.

A general purpose fishery for herring occurs in Northern Puget Sound in the fall and winter.

c. Occurrence

Areas of documented herring spawning should be indicated in the Draft EIS. Areas of concern are Sequim Bay, Discovery Bay, Port Townsend Bay, the Port Gamble-Seabeck area in Hood Canal, the area from Quilcene Bay to the mouth of the Duckabush River in Hood Canal, Totten Inlet and Quartermaster Harbor in south Puget Sound.

d. Operational Impacts

The impact of an oil spill on the herring population should be explained in terms of (1) impact on subtidal and intertidal vegetation utilized by spawning herring, (2) impact on planktonic larvae, (3) impact through the food chain on other fish populations, and (4) impact on the fishery for herring with subsequent ramifications in the recreational and commercial fisheries for other species.

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CONT

e. References

Information should be included from the U.S. Fish and Wildlife Service Publication, Puget Sound Herring Surveys Including Observations of the Gulf of Georgia sac-roe Fishery, 1975-1977, John R. Meyer and Robert A. Adair, March, 1978. The 1975 fishery statistical report from Washington Department of Fisheries can be consulted for the total poundage of herring landed in Puget Sound by year from 1935 through 1975 (p. 59).

Hydroacoustic Assessment of Puget Sound Herring, 1972 through 1978, Washington Department of Fisheries Technical Report No. 41, by Norm A. Lemberg, 1978, lists acoustic surveys for herring in many areas adjacent to the preferred pipeline route. A description of the commercial fisheries can be found in Progress Report #74, the 1976 Marinefish Program, (1978) and Progress Report #12, Effects of Limited Entry Legislation on Management of Washington State Commercial Herring Fisheries, Bob Trumble (1977).

General Comments: Impacts in the Fishery

Statements concerning "impacts" on a given marine or freshwater resource should be as specific as possible. It is insufficient to say that there will be loss of a resource or loss of harvest of a resource. What is the estimated loss and what are the economic implications of this loss? There is economic information in a WDF April 4, 1978 letter (especially in the four Appendices to that letter) to relate individual fishery resources to their landed values. How many pounds of fish would be lost or be unharvested because of an oil spill and what is the value of that resource or harvest?

What could an oil spill mean in terms of lost gear to salmon fishermen, for example, if a spill fouled the gear? What is the average cost of commercial gear of various types?

The statement is made repeatedly that impacts may occur on the salmonid populations in the streams due to construction but will not be noticed in the fishery. Impacts from an individual stream crossing might have impact in the fishery and the number of stream crossings entailed could result in profound effects collectively in the fishery. This is reflected by the dollar value figures developed by the Department of Fisheries and sent to Stanford Research Institute (Mr. Allen Zink, April 4, 1978 letter). The dollar values designated as "river of origin values" in Appendix 2 of the letter to Mr. Allen Zink should be listed in the Draft EIS by watershed. While these are minimal estimates, they do reflect the direct economic gain from the salmon reared in the watersheds crossed by the preferred Northern Tier alternative.

We recommend that the potential economic impact in the fishery be included for some typical sections of the stream. For an example, if a mile of stream supported 100 coho salmon (stream counts have estimated densities of over 3000 salmon/mile on occasion in streams crossed by the preferred route) these fish would produce enough juvenile salmon so that in most cases at least 300 fish would enter the catch as adults 3-4 years later. (A catch to escapement ratio of 3:1 for coho is conservative based on coded wire head tag data collected by Washington Department of Fisheries). Three hundred fish would be worth $1788.00 to the fishermen if sold at the average 1976 price paid for Puget Sound net-caught coho. Their value as sport caught salmon would be $7680.00 using the figures from Higgs, 1977. Proper timing of construction and acceptable construction practices are mandatory to avoid impact on salmonid resources of the streams involved.

General Comment: Oysters

a. Life History and Occurrence

1. Oysters live in the intertidal area and spawn when water conditions, particularly temperature, are correct. The eggs and the resulting larvae are planktonic for a two to three week period and are extremely sensitive to toxic materials during this stage. Upon reaching the proper stage of development, juveniles settle to the bottom, become attached to some clean hard substrate and continue to grow.

2. Olympia Oysters

There are a very few areas in the State of Washington where the native oyster or Olympia oyster is cultured presently. Due to their more limited occurrence geographically, impact on the culture area in southern Puget Sound may have severe effects on the total Olympia oyster production for the state particularly since there are only scattered stocks and cultured stocks are at a low level. The distinction should, therefore, be made in mapping and impact discussions between occurrence of Olympia oysters and occurrence of the Pacific or Japanese oysters.

3. Spawning Areas for Pacific Oysters

The Pacific or Japanese oyster was originally imported to the U.S. from Japan and much of the Pacific Coast industry was sustained by annual importation of seed from Japan. A few areas of the marine waters of Washington State are warm enough to allow consistent spawning of the Pacific oyster. Dabob and Quilcene Bays in Hood Canal are places where Pacific oysters spawn on a fairly regular basis. This area, therefore, provides the only dependable source of oyster seed for a significant amount of the Pacific oyster culture which occurs throughout Washington State.

b. Operational Impacts

1. Planktonic Stage

Due to the extreme vulnerability of the planktonic state of the oyster life history, an oil spill during this period could have profound affects. Depending on the location of residual material, a continuing affect could occur as long as toxicity persists.

2. Oyster Spat

An oil spill on the substrate used for setting and spat collection or following the setting of the oysters on hard substrate could have toxic and suffocating effects on the oyster spat. Ramifications for the oyster industry throughout the State in the case of a major kill of oyster spat need to be explored. Since Japan is no longer a major source of seed due to economic reasons, the impact of multiple spills or persistent toxic affects on oysters spat or seed beds also needs discussion. Lost production throughout the State and subsequent economic impact due to lack of seed or degradation of seed producing areas would affect areas far removed from the pipeline route. Quantification of the biological and economic implications of such impacts would give decision makers the information upon which to base sound judgements.

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3. Toxicity and Smothering of Adult Oysters

The statement is made in the Draft EIS that there could be sub-lethal affects on adult oysters in the case of an oil spill. Direct toxicity and smothering of adult oysters should also be addressed. The landings of oysters by area (listed in the appendices to the April 4, 1978 letter from Fisheries) belong in the EIS along with the value of the this resource.

4. Toxic Sediment

The statement is made in the Draft EIS that sediments may remain toxic to oysters and other shellfish following a spill. Some estimate as to how long the soluable, toxic fractions would take to disperse or biologically degrade should be included (i.e., how long will sediments remain toxic to shellfish?). Will the toxicity preclude the setting of spat or cause deformity and mortality of juvenile oysters? An estimate of the lost oyster and oyster seed production in worst case spills, at pipeline crossings affecting Dabob Bay, Quilcene, Hood Canal and south Puget Sound should be included in the EIS. This estimate should include both (1) the biological impact on the resource itself and (2) the dollar value of the resource lost immediately and throughout the duration of the effects of the spill. In addition to the toxic effects of oil on molluscs, tainting of the meats may occur. Oyster or clam beds receiving sufficient concentrations of oil or fractions thereof, may be decertified for commercial harvest by the Washington Department of Social and Health Services which is responsible for food protection. Local health authorities may also close recreational digging on beds affected by oil spills either because of tainting or potential toxicity. The persistance of toxicity and tainting needs to be explored quantitatively, therefore.

5. The effect on oysters of usual "clean-up" measures after an oil spill should be discussed. Historic spills such as the Amoco Cadiz which have affected oyster culture areas should be discussed in terms of immediate biological impact, increased susceptibility to disease, natural recovery, effectiveness of clean-up measures, and economic effect of the spills.

General Comments: Salmon

② a. Pink Salmon - One species of salmon, pink salmon (Oncorhyncus gorbuscha), merits special mention. Pink salmon are fish which return at two years of age to spawn. There is no spawning at any other age. An impact to a population of pink salmon may be more devastating because other brood years will not overlap to fill in for the lost fish. Note of the unique aspect of pink salmon life histroy should be made in the EIS as impacts will be potentially greater for this species.

b. Recovery of Salmon Spawning Beds

③ 1. Construction - The statement is made repeatedly in the Draft EIS that construction impacts (i.e., siltation in the spawning beds) will last for one year and will only affect one brood year of salmonids. Heavy siltation in a stream may have effects which last beyond a single year or the next period of high water flows as the Draft EIS states it Silt may wash out of the upper most layer of gravel and remain in the deeper layers. It may move downstream from the construction site and come to rest in slower moving reaches of the river. These slower reaches in some cases may be gravel beds close to the mouth of the river used by pink and chum salmon. High water flows may be ineffective in moving heavy silt loads in these stretches due to the gradient-width characteristics of the stream. Siltation in salmonid streams has the potential for devastating spawning and rearing areas over a considerable period of time and, in some cases, indefinitely. The EIS should be revised to reflect this.

④ 2. Operational - The statement is made repeatedly that streams will clear rapidly and no residual effects shall be left in the case of an oil spill. We question these statements.

Examples of stream and riverine oil spills should be sought and discussed in the EIS. In particular, we have concerns with oil which might residualize in a stream due to entrainment and incorporation into the banks and substrate. At low flow periods, many gravel bars used by spawning salmon are exposed and would be affected by such oil. The formation and characteristics of "mousse" in a turbulent stream (or at the base of a hydroelectric dam?) should be discussed.

The effect of an oil spill in a stream on saltwater marsh areas is discussed primarily in reference to brids. The tidal channels of some salt marsh areas and the shallow intertidal and subtidal marine areas of the Sound are used heavily by juvenile salmonids, especially pink and chum. They feed heavily on epibenthic organisms such as harpacticoid copepods during this phase of their life history. These fish are therefore vulnerable to direct toxicity (since they frequent shallow water areas) in the case of a spill which found its way to estuarine and/or marine waters. They are also subject to impact due to an effect on the food organisms on which they depend.

⑤ c. Water Withdrawal - Water withdrawals are listed for two reasons. One of these is ballasting the empty tankers before they leave the Port Angeles Harbor after unloading. The water intake systems of the ships should be described in the EIS. Of particular concern is the screening of the ship water intakes, the location and the depth of the intakes. These water intakes might have the potential for sucking up fish which are in the area including juvenile salmonids if the intakes are not properly placed or screened. The approach velocity of the intakes should also be listed.

Water withdrawals in fresh water are also listed for hydrostatic testing of the tank farm and pipeline. The screening of these water intakes again should be listed including the approach velocity. The location of the water intakes and design of these structures should be included. The location of the intakes and per cent reduction of stream flow are of interest. Minimal flows at sometimes of the year may preclude use of some water sources.

Mention is made of herbicides to prevent growth of algae inside the pipeline. The type of herbicides and the amount of herbicide to be used should be included in the EIS. The literature available concerning the environmental affect of this herbicide should be listed. Treatment of the water prior to release back to the proposed receiving streams should be listed. How effective is the proposed treatment? Please explain and document the statement that a dilution of 5:1 is required if the bacteriacide is not to produce toxic effects. Explain which species are potentially involved.

The discharge of this water is also of concern. The point of discharge and the mitigative measures to prevent bank and streambed erosion at the point of discharge should be listed. The statement that damage to the environment will not result from a discharge of 6 cfs of less should be explained in detail. The point of discharge, the configuration of the discharge system, and the time of year of the discharge are all important in this regard and should be addressed. It is important to relate the source of the withdrawal and the proposed receiving waters so that fisheries resource agencies can assess the potential for fish disease transmission from watershed to watershed.

CONT

General Comments: Stream Crossings

a. Cross Section Drawings Needed

⑥ Adequate drawings including cross sections of all stream crossings are needed for proper evaluation of the potential impact. These are available for 19 stream crossings (Army Corps of Engineers Seattle District Public Notice 071-OYB-2-004693), but are needed for all stream crossings.

b. Alternative Techniques

⑦ Other types of stream crossing techniques also merit consideration. Various techniques should be included and may be required to minimize impacts on salmonids and other fisheries resources downstream. Techniques of interest include tunneling under streams with the pipeline. This is done on other projects, and is listed as a potential means of crossing roads and highways for the Northern Tier Proposal. The method should be discussed for crossing streams.

Another technique which is not discussed at all is aerial crossing of streams by a means of elevated pipeline. This technique may have several advantages. The cuts which are required on slopes of the hills on either side of the stream are not nearly as deep in deep narrow canyons. The amount of earth exposed and the potential for erosion therefore would be much lower from these surfaces. The pipeline might be less likely to suffer avulsion in the streambed. Finally the pipeline could be carried across the stream in a pipe-within-in-a-pipe type configuration. The outer pipe could be sloped to a catch basin located on the downhill end of the outer pipe. The catch basin could be sized to contain the predicted maximum spill in the case of a rupture in the stream crossing.

The possibility of coffer damming within the wetted perimeter of the streambed to minimize siltation should be discussed. The crossing might be accomplished by working in only 1/2 of the streambed at once.

c. Blasting within Streams

⑧ Since some fauna live in the stream all year round (including some species of juvenile salmonids) there is always some potential for mortalities to aquatic life from blasting even with optimal timing. Blasting should not be the preferred technique if other alternatives are feasible.

Blasting in bedrock is mentioned as a potential need. Techniques used for blasting in watershed areas should be the drill and blast method rather than use of shape charges. With drill and blast method the rock is drilled and the charge placed in the drill hole. The precussion from the blast emanates in a narrower band up through the water column. With shape charges placed on the surface of the rock, the precussion would emanate from the blast site at a much wider angle in the water column (essentially 360 degrees from the location). Timing of blasting to avoid periods of intense salmonid use is essential.

d. Underground Aquifers

⑨ Underground aquifers are mentioned in various places in the Draft EIS. The potential for and effect of breaking into an underground aquifer at a stream crossing should be discussed in the Draft EIS. The effects of concern include a percentage of the stream flow entering the aquifer and therefore being unavailable for downstream organisms including salmonids. An increase in flow in the stream due to an artesian spring type situation from penetrating an aquifer could also have an affect on stream fauna. If the streamflow and the potential for erosion were increased, impact on salmonids could occur. Boring test holes to determine the presence of aquifers at stream crossings should therefore be done.

e. Time Table for Revegetation

⑩ Revegetation is mentioned as a mitigative measure both to control erosion and to diminish aesthetic impact from the proposed construction. A time table for revegetation should be included. The duration and time of year of bare earth conditions should be clearly stated for each stream crossing involved and should be minimized.

f. The Number of Stream Crossings

⑪ We question the numbers of " Major", "Minor" and "salmonid bearing" stream crossings listed in the DEIS. Table 1 of this letter lists many (but not all) of the streams within the pipeline corridor in Washington State. Table 2 lists most of the streams within the corridor of the "Cross Sound" Alternative. Depending on where within the corridor the pipeline was located, more streams could be crossed. It should also be noted that most of the streams which are not salmon-bearing are tributary to streams which do receive salmonid use.

g. The Yakima River

⑫ The pipeline corridor includes an exceptionally fine spawning area for spring chinook salmon (and other salmonids). The pipeline should cross the river downstream of the Cle Elum bridge to avoid this critical area.

h. Measures to control siltation during construction

⑬ Because of the potentially devastating effect from siltation in salmon streams and on some nearshore shellfish beds, all efforts should be incorporated into the project to minimize silt in runoff water from construction sites. Such measures include but are not limited to construction during the dry low-flow months, construction and maintenance (including dredging) of sedimentation basins, use of staked straw bales, sandbag impoundments, filter blankets and/or covering exposed earth with plastic to minimize erosion. Spoils from dredging should be placed in retention basins which will allow settling of silt and solids before return flow reaches the stream.

General Comment: Surf Smelt

a. Surf Smelt Life History

⑭ Surf smelt (Hypomesus pretiosus) are a species of marinefish which spawn intertidally on fine gravel. Maximum spawn intensity occurs on the upper ranges of the intertidal area (close to mean higher high water). Eggs incubate for two weeks or more before hatching. Smelt larvae (like herring and other species) are planktonic for several weeks before metamorphosing into juveniles. The presence of surf smelt spawning beaches in the saltwaters adjacent to the pipeline route should be mentioned in the EIS. Of particular concern are smelt spawning beaches in southern Hood Canal and south Puget Sound. Approximately half of the smelt spawning beaches which have been documented in Puget Sound occur south of Johnson's Point in Thurston and Mason Counties. Approximately 60% of the documented surf smelt spawning beaches occur in the marine area potentially impacted by spills from the primary "Around the Sound" Route.

b. Impacts from Oil Spills

The types of impacts which are of concern include the direct impacts on smelt eggs which are deposited intertidally, the impact on the sediment or substrate which the smelt require for spawning, and impact on larvae.

1. Incubating Eggs

Since nearshore oil spills in marine waters generally involve heavy deposition and accumulation of petroleum products in intertidal habitats, smelt spawn is a potentially very high impact resource. The impact on eggs would fall into two categories. The first category would be an affect from an oil spill during spawning season when the eggs may be

CONT

present on the beach. Oiling at this time would have the potential for both suffocation and toxicity to the incubating eggs thus reducing the number of surviving juveniles. A second type of impact on the eggs would arise if oil were mixed in the preferred sediment or substrate of the smelt and subsequent spawning took place. Again, mortality to the eggs might ensue if soluble toxic components of the oil were still present.

2. Substrate

A second type of effect on the sediment or substrate which is of concern would be a change in the substrate character due to the oiling. If sufficient quantities of oil were mixed into the fine loose gravel preferred by the surf smelt, the beach may change in character. For example when some gravel beaches on which a heavy deposit of oil has been weathered to leave only the heavy tars, the beach has taken the character of asphalt paving (for example, the Metula oil spill). In such a case, surf smelt might avoid the beach as a spawning location. Surf smelt eggs which are deposited on an impervious surface are known to experience high mortality due apparently to desication during incubation. Since surf smelt populations are basically limited by the presence and extent of suitable habitat, loss of this substrate due to oil spills would have an adverse impact on the population. The time required for substrate restoration through natural processes (or the range of time) might be estimated for a major spill and should be listed for a typical beach. The vast majority of surf smelt spawners are two years old or less. Localized extinction of spawning populations could occur from beaches being rendered unusable

3. Larvae and Juveniles

Larvae occupy the upper portion of the water column and are therefore vulnerable to impact due to toxicity of oil slicks. The potential impact to planktonic larvae should be discussed.

Juveniles one year or less in age dwell in the near-shore area. Toxic water conditions in this area and potential impacts on their food organisms (plankton) are therefore of concern and should be discussed.

c. References

For documentation of the type and location of beaches used by surf smelt presently, Technical Report Number 42 by Dan Pentilla, 1978 should be consulted. Progress Report # 39 lists juvenile surf smelt food organisms.

Specific Comments

⑮ Section 1 - Description of the Proposal

Page 1-3, Col 2

List the capacity of a barrel in gallons and the B.T.U.'s in a gallon so the two tables can be related.

Page 1-7, Col 2

Approximately how many barrels are held by the various sizes of tankers listed in "dwt" (dead weight tons).

Page 1-11, Col 1, para 9

Discuss any vessel anchorage areas in P.A. Harbor relative to the submarine route.

Page 1-14, Col 2, para 4

Will there be any soluable fractions left in the tank roof and bottom drain runoff which will not be separated by the oil-water separators. Estimate on a worst case basis including any impact on Siebert Creeks salmon population.

Page 1-22, Table 1.4-B

There are minor streams in Clallam, Jefferson, Pierce, Thurston, and Mason Counties which should be included.

Page 1-24, Col 2, para 1

Where will the traps be located? Dikes are needed around the trap areas.

Page 1-28, Col 1, para 1

"Major equipment" should include the leak or pressure sensors.

Page 1-44, Col 1, para 1

Boring and casing the pipe should be discussed as a stream crossing method as well as for crossing highways.

Page 1-46, Col 1, para 1

1. Having dredging equipment rest on the bottom is destructive to streambeds. work should be accomplished from the bank, behind coffer dams, etc. See General Comment:Stream Crossings (b. Alternative Techniques)

2. Excavated material should not be stockpiled in the streambed.

Page 1-47, Col 1, para 4

See General Comment:Salmon (c. Water Withdrawals).

Page 1-56, Col 2, No. 4

Funding for salaries for the "environmental inspectors" should be provided to resource agencies which will then hire the personnel. For some highly sensitive areas, several types of inspectors may be needed (fish versus upland game, for example). The authority of these "inspectors" to influence construction should be discussed. They should have the power to stop and/or modify construction as needed.

Page 1-57, Col 1

No. 10 See General Comment:Stream Crossings (e. Time Table for Revegetation).

No. 12 See General Comment:Stream Crossings (c. Blasting Within Streams)

Page 1-57, Col 2, No. 21

The depth of burial of the pipeline at the stream crossing is important information and merits more discussion.

Page 1, Col 2, SOHIO

The status of this proposal has changed.

Section 2 - Description of the Environment

Page 2-11, Col 1 "Slope Instability"

⑯ How will the proposed changes in the bluffs at Green Point affect long shore drift and consequently Dungeness Spit? Relate any changes to the fish and shellfish resources and harvest which occur inside Dungeness Spit.

CONT

Page 2-13, Col 1, para's 2 and 5

⑰ We note with interest that Siebert Creek borders the storage facility. The first sentence in paragraph 5 is incorrect. Since there are salmon in Siebert Creek, there are "significant" freshwater biological resources associated with the facilities.

Page 2-15, Col 2

We note with interest that the currents will always carry spilled oil east either offshore or onshore from Port Angeles.

Page 2-20, Col 1 "Marine Ecosystems"

Add a discussion of reproduction including the planktonic larvae stage common to most marine species.

Page 2-21, Col 2

para 5 - The West Coast of Washington State would also be exposed to an increased threat of oil spill and should be included. Offshore commercial and recreational bottomfish, salmon, crab and shrimping areas might also be involved.

para 6 - List the species of shellfish and areas involved (Appendix 2 of the letter to Mr. Allen Zink of SOI, April 4, 1978). List some of the important marinefish species including halibut (see Appendix 3 & 4 of the April 4, 1978 letter). Mention all net fisheries and areas fished (trawl, gill net, purse seine). The importance of the North Sound commercial salmon fishery should be mentioned. Canadian salmon are taken there. If not harvested (due to an oil slick, for example) a year's harvest may be lost to the American economy. See General Comment:Oysters, Clams, Herring, Smelt, Groundfish, Crabs.

Page 2-22, Col 1, para 1

The statement that fishing intensity and fish populations are directly related is incorrect. Fishing intensity often relates to proximity to good launching ramps, population centers, etc. Large catches obviously may relate to substantial fish populations however low catches may reflect low fishing intensity. Catch per unit effort is a better indicator of population strength. Catch alone does indicate occurrence of the species and can be used to calculate the economic value of the population as presently exploited.

Page 2-37, Col 1, para 4

⑱ Neah Bay is an important recreational bottom fishing area. Smelt raking should also be mentioned.

Col 1, para 5

These paragraphs under-rate razor clam digging, an extremely important recreational activity.

Col 2, para 2

North Puget Sound is an important recreational bottom fishing area including sport SCUBA diving.

Page 2-39, Col 2, Table 2.1.1.15-4

⑲ Foot note 3 should read "includes all of the designated proportions plus the San Juan Islands, Gulf of Georgia, Port Susan and Saratoga Pass."

Page 2-41, Col 2, Table (no number)

Where is commercial fishing designated?

Page 2-57, Col 1, para 6

WDF will be listing optimum crossing times on a stream by stream basis. We note that N.T.P.C.'s proposed construction period extends from a portion of juvenile salmon out migration into spawning seasons for some salmon which may not be permitted.

Page 2-57, Table 2.1.1.6-1

⑳ All salmon bearing waters should be listed as "Major Stream Crossings".

Page 2-57 and following

㉑ More streams need discussion due to salmonid resources See General Comment: Stream Crossings (f. The Number of Stream Crossings). Groundwater pockets should be listed on a stream by stream basis. (See General Comment:Stream Crossings, d. Underground Aquifers). We note with interest the number of stream crossings which have steep walled access and refer to the General Comments:Stream Crossings (b. Alternative Techniques and e. Time Table for Revegetation).

Page 2-78, Col 2, para 1

The word "biological" should be changed to "zoological".

para 3 Mention timing of non-resident (or anadromous) salmonids. Mention juvenile rearing and timing of out-migration. Mention the need for sediment-free water for stress free rearing including feeding activities. Mention the need for sediment free gravel. Water percolation through the gravel is needed. See General Comment:Salmon (b. Recovery of Salmon Spawning Beds, 1. Construction).

Page 2-79, Col 1, para 1

"Some western Washington streams..." should read "Most western Washington streams..."

para 5 Unless blocked by impassable barriers, most small streams contain salmon (such as coho) as well as "forage fish".

Page 2-79, Col 2, para 2, Table 2.1.2.6-19

Listing only "selected western Washington salmon bearing streams is highly misleading. Please see General Comment:Stream Crossings (f. Number of Stream Crossings). We consider Table 1 (attached) fairly minimal and yet it is many times longer than the insufficient list in the Draft EIS. Also list the dollar value of the drainages from the "River or Origin Values" listed in Appendix 1 of the April 4 WDF letter to Allen Zink.

Page 2-81, Table 2.1.2.6-18

㉒ There are Indian fisheries on more rivers than this Table indicated. The Dungeness, Puyallup, Green-Duwamish, and Cedar runs are fished by Indians in fresh or brackish waters, for instance. WDF Enhancement Projects should be listed. See attached list. Non-treaty terminal gill net fisheries could also be impacted by an oil spill which precluded fishing. This could be handled by adding another column.

Page 2-28, Table 2.1.1.6-19 Foot note 4

㉓ The sockeye escapement goal of the Cedar River is 350,000 fish and should be used for capacity of the river.

141

Page 2-83

24 The Yakima River has very important spring chinook salmon spawning grounds at the crossing site and merits inclusion (See Stream Crossings, g. Yakima River). The Columbia River and Big Creek and attendant resources should also be included.

Page 2-88, Col 2, para 1

Herring and smelt occurrence, commercial and recreational (for various species) fisheries should be mentioned. Commercial salmon gill netting and purse seining is important in many of these areas. See General Comments:Oysters, Herring, Smelt, Crabs, Clams (Commercial quantities of other clams should be mentioned.)

Page 2-133, Col 2, para 4

Are any of the other pipelines listed functioning at less than full capacity? Could any of these be used to transport some crude?

Page 2-135, Col 2, para 4

See General Comment:Surf Smelt, Herring, Oysters, Crab, Clams, Groundfish.

Page 2-138, Col 1, para 1

See General Comment:Surf Smelt, Herring, Oysters, Crab, Clams, Groundfish.

25 Page 2-138, Col 1, para 1

Recreational bottom fishing is very important in the Tacoma Narrows area supporting a charter fishery as well as private boaters. Smelt should be mentioned. See General Comment:Oysters.

Page 2-155, Col 1, para 2

Raft culture of oysters is also an available technology. Pen culture of salmon and other species is on-going presently and has growth potential.

26 Page 2-160, Col 2, para 5

Plans are being implemented to augment artificial salmon production.

Section 3: Impacts of the Proposal

27 Page 3-3, Col 2, para 1

Are the engines water cooled with seawater? If so, while running at the dock to pump out the cargo, are the water intakes screened?

Page 3-11, Col 2, para 6

28 A more complete discussion of the potential impact of a potential slope failure at Green Point. What would occur to the beach and marine life at Green Point (burying under sediment)? What effect could this have on the adjacent and contiguous beaches and the fishery resource nearby (include Dungeness Spit)? If slope failure occurred would turbidity increase in nearshore marine waters and have a subsequent effect on marine life.

29 Page 3-13, Col 1 para 3

Where will the 1.4 to 3.2 tons of soil per year eroded off the onshore storage facilities go? All efforts should be made to minimize siltation reaching Seibert Creek. This amount of siltation in salmon spawning grounds can have severe impacts if the eroded material settles into the interstices of the gravel. See General Comment:Stream Crossings (h. Measures to Control Siltation) and Salmon (Recovery of Salmon Spawning Beds, 1. Construction).

para 4 How does the predicted 0.01 - 0.02 tons/acre/years post-construction erosion relate to the present rate.

Page 3-14, Col 2, para 1

30 See General Comment:Salmon (c. Water Withdrawals). What will the temperature charges amount to in absolute figures (a maximum change of how many degrees)? Is there any potential for a temperature block for migrating salmonid adults or increasing the potential for juvenile diseases?

Page 3-14, Col 2, para 7

See General Comment:Salmon (b. Recovery of Salmon Spawning Beds), Stream Crossings (h. Measures to Control Siltation).

Page 3-15, Col 2, para 3

Surf smelt should be included. See General Comment:Impact in the Fishery.

31 Page 3-15, Col 2 para 6

Please provide a more detailed description of the impacts which would occur to the specific resources of the area due to the severe siltation described for this operation. Sediment analyses are needed. Do they meet EPA criteria for in-water disposal. Timing of such potentially major impact portions of the proposal is critical to avoid juvenile salmon out-migration, for example.

Page 3-18, Col 2, para 1

32 If in-transit risks actually began, as this paragraph states, when tankers pass Cape Flattery, then there should never have been any off-shore oil spills. There have been spills off-shore historically so this statement is incorrect.

para 2 The estimated time the oil took to reach the furthest extent of the modeled spills and the wind and sea conditions used in the model should be listed.

33 para 4 The time or range of time crude would take to weather out of "low energy" shorelines should be listed.

para 5 This paragraph is entirely insufficient. Why was the figure 87,000 barrels chosen (does it relate to a projected spill figure)? The 70% reduction of "existing oxygen" (dissolved oxygen or D.O.?) would extend over how large an area? What would D.O. be throughout the extent of the impact and how would this affect fishery resources, their harvest and the economic return to the fishermen and the economy? How long would D.O. remain down? What are the anticipated effects on the resources, harvest, etc. from the "mutagens, carcinogens and other toxic compounds" mentioned? What are these compounds specificly and what concentrations could be expected over what area for how long?

Page 3-26, Col 2, para 2

If bottom contours were lowered below the photic zone or if the organic "soil" of the eelgrass bed were dredged out, regrowth might be impossible or retarded. Discuss relative to the type of impacts anticipated on the eelgrass. Mention the fish species associated with eelgrass. (See General Comment:Crab).

Page 3-28, Col 1, para 3

Include other species (See General Comments:Herring, Surf Smelt, Oysters, Clams, Crab, Groundfish).

CONT

Page 3-28, Col 2, para 3

General biological effects might also include a delay in salmon migration and an unnecessary reduction in harvest. Potential impacts should be dealt with in much greater detail (See General Comments:Impacts in the Fishery).

Page 3-29, Col 2, "Plankton"

Mention the larval stages which most marine fish and shellfish species have and their vulnerability.

"Benthic organisms"

The importance of some oyster areas to the rest of the Sound because of their production of seed oysters is worthy of mention, notably Quilcene Dabob Bay (See General Comment:Oysters).

"Fish"

Intertidal breeders (smelt and herring) are high impact species. Avoidance of an oiled area by salmon adults should be discussed.

Page 3-23, Col 1, "Shellfish"

Spill trajectories cover more than just Port Angeles Harbor. Discuss resources accordingly.

Page 3-33, Figure 3.1.7-9

| Animal or plant group | Habitat | Comment |
|---|---|---|
| Crustaceans | Sand, mud, mixed-coarse, mixed-fine | Mention food organisms (harpacticoid copepods) gammerid amphipods, etc.) |
| Crustaceans | Sand & eelgrass | Important crab spawning areas |
| Mollucks | Sand | Razor clams make this habitat extremely important on the coast. |
| Mollusks | Mud | Oysters could undergo severe mechanical impact |
| Fishes-Open Water | Eelgrass | Herring spawn would undergo severe "mechanical impact" |

34 Page 3-42, Col 1-2, "Operation Phase"

Vessel anchorage areas in PA Harbor should be discussed. Potential for pipeline rupture due to ships dragging anchor. How deep do the anchors of the largest ships plough given strong seas sufficient to cause the ship to drag anchor? Will there be disruption of the local recreational fishing traffic due to Coast Guard proposed regulations limiting the proximity of small boats to the vessels?

Page 3-48, Col 1 para 4

See General Comment:Impacts in the Fishery.

para 7 Recreational bottom fishing around Neah Bay is important.

Col 2, para 2

See General Comment:Surf Smelt.

35 Page 3-50, Col 2, para 4

"the loss would be mainly in fishing time". Please revise this to add the economic implications of lost fishing time and potential damage to gear. Also add a comment about underharvest of stocks due to inability of fishermen to fish (See General Comment:Impact in the Fishery). In the case of Canadian stocks, this income could be lost completely when the fish leave U.S. waters. For U.S. fish, unharvested "enhancement" produced - to-be-harvested fish could over spawn on wild fish redds. Over spawning can reduce survival.

para 5 The additional work mentioned to assess impacts on recreational income, commercial and Indian fishermen's income for all species should be included in the Final EIS.

36 Page 3-51, Col 1, para 3-4

An estimate of the beach clean-up costs of the modeled spills should be included. Miles of various shoreline types can be gotten from Department of Ecology's Coastal Zone Atlas of Washington.

If an estimate of the cost of open water clean-up can be made (based on historic spills, for example), it should be included also. The clean-up costs thus developed should be compared to the liability figures listed.

Para 4-9 CRISTAL seems to be the only liability provision which could cover costs encurred by commercial fishermen since private individuals can apply for this compensation. Is this correct? Would it pay for lost income due to lost fishing time and/or damage to the resource supporting the harvest?

Page 3-6-, Col 1, para 3

See General Comments:Stream Crossings, c. Blasting within Streams

Page 3-60, Col 2, para 2

We note with interest the anticipated problems with slides in areas of slope instability. Since much of the Puget Sound area is listed previously in the document as having slope instability, it is of MAJOR concern to us relative to salmon and near-shore marine species. See General Comments:Stream Crossing (a. Cross Section Drawings Needed, b. Alternative Techniques, h. Measures to Control Erosion).

Where slopes are the steepest, rerouting the pipeline corridor to avoid unstable slopes should be considered. The principle of routing the pipeline through existing corridors may not minimize impacts if the utility in the existing corridors is not one which entails as high a risk of slope failure. The last sentence in the paragraph should be enlarged to include the biological impacts of slides in detail (See General Comment:Impacts in the Fishery).

Page 3-61, Col 2, para 3-4

We note with interest the slope instabilities mentioned. Is there any way the pipeline can be routed around such areas.

Page 3-65, Col 1, para 4

Please explain the revegetation program in greater detail.

Col 2, para 2

We notice that on the average over 3 spills per year from the pipeline are anticipated.

CONT

Page 3-67, Col 1, para 4

37 What would the effect of the described sedimentation be? See General Comment: Impacts in the Fishery, Stream Crossings (b. Alternative Techniques, h. Measures to Control Siltation) and Salmon (b. Recovery of Salmon Spawning Beds).

para 5 See General Comment:Impact in the Fishery.

Col 2, para 2-3

See General Comment:Salmon (c. Water Withdrawals).

38 Page 3-67

How many miles of stream crossings are entailed in crossing the small tributaries not listed in the DEIS (see attached Table 1).

39 Page 3-68, Table 3.2.6-1)

What would the estimated sediment load be for alternative stream crossing techniques? How long would the silt load remain high? For those crossings adjacent to salt water, impacts on shellfish and marine fish species should be detailed.

Page 3-72, Col 1, para 3

Construction timing should minimize smothering eggs in the gravel.

Para 4 See General Comments:Salmon (a. Pink Salmon and b. Recovery of the Salmon Spawning Beds), Impacts in the Fishery, Stream Crossings (d. Underground Aquifers).

Page 3-72, Col 2, para 1

See General Comment:Recovery of Salmon Spawning Beds - Operational Impacts.

40 Para 2 See General Comment:Impacts in the Fishery, Salmon (a. Pink Salmon and b. Recovery of Salmon Spawning Beds).

41 Para 4 Please detail the impacts involved.

Para 6 Please See General Comments:Salmon (c. Water Withdrawals).

42 Page 3-73, Table 3.2.6-3

Retitle to indicate freshwater and anadromous species only covered. "Sediment/Remarks": The "worst-case" situation would entail pink salmon. Please see appropriate general comment.

"Oil Spill/Pipeline Rupture" Impact could be high in some salmonid streams. The time frame for duration of effects may be severely under estimated. "Several miles downstream" may also be a severe underestimate. In 1978, a spill at Portland, Oregon affected river beaches almost to the mouth of the Columbia River.

"Oil Spill/Remarks" See General Comments:Salmon (a. Pink Salmon and b. Recovery of Spawning Beds), Impacts in the Fishery.

Page 3-74, Table 3.2.6-4

Add an extra column "Annual Value of Fish produced" (from the WDF-Zink April 4, 1978 letter). List all salmon bearing streams (see attached list of crossings, Table 1). Delay in adult migration and subsequent loss of spawn would seem to be a potential with any of these streams. Add columns for commercial and recreational harvest of salmon. Foot note 2: Spawning area downstream should also be noted since spills and siltation could impact these.

Page 3-75, Col 1, para 2

See General Comment:Stream Crossings (b. Alternative Techniques).

43 para 5 This paragraph falls far short of estimating "worst case" situation. See General Comment:Salmon (a. Pink Salmon, and b. Recovery of Salmon Spawning Beds) and Impacts in the Fishery.

Page 3-75, Col 2, para 5

See General Comment:Salmon (a. Pink Salmon), Impact on the Fishery. Calculate the dollar value of a "short stream segment" (line 12) and include it.

44 Page 3-75, Col 2, para 5 and Page 3-78, Col 1 , para 1

The statement that the entire salmon population of some Hood Canal streams could be impacted completely contradicts the previous statements about there being only small, insignificant, one year unnoticeable impacts. Please note and MODIFY all other statements to conform to this one.

45 Page 3-78, Col 1, para 6

Since there are over one hundred stream crossings in the State of Washington, (see attached list), the number of instream spills per year in Washington State should be calculated and listed (at the stated rate of 1 spill/65 years/pipeline crossing).

46 Page 3-78, Col 2, para 1

Interference with commercial fishing may also occur. See General Comment: Impact on the Fishery.

Page 3-78, Col 2, para 2

Several miles may be a severe underestimate. Direct impacts of oil in the sediments and gravel of turbid streams should be discussed. See General Comment:Salmon (b. Recovery of Salmon Spawning Beds, 2. Operational).

Page 3-78, Col 2, para 4

Salmon egg boxes and new "enhancement" facilities should be included.

Page 3-79, Col 1, para 1

Discuss long term sedimentation impact due to steep slope instability. See General Comment:Salmon (b. Recovery of Salmon Spawning Beds) and Stream Crossings (b. Alternative Techniques).

Page 3-79, Col 2, para 1 and 5

Paragraph 1 seems to contradict paragraph 5. If stream crossings are expected to degrade $H_2O$ quality in Hood Canal for months how can there be No Impacts to the shellfish resources of the marine waters?

Page 3-80, Col 1, para 2

See General Comment:Herring, Smelt, Oysters, Clams, Crab, Groundfish, Impacts on the Fishery. This section is entirely inadequate and needs major revision and enlargement to accurately depict resources and potential losses.

47 Page 3-84, Col 2, Para 5

What chemicals would be proposed for control of woody vegetation. Are the chemicals cleared for in water use? Discuss the potential and impacts from runoff into the streams and marine waters.

CONT

48 MITIGATION

Discuss bonding of the company to cover 1) Restoration of lost habitat and resources, 2) Lost income of any commercial fishermen or fish farmer due to construction or operation, 3) Lost commercial fishing gear due to fouling, 4) Any necessary clean-up and/or removal of equipment following the life of the project, 5) necessary environmental protection actions in the case of bankruptcy.

A complete oil spill clean-up contigency plan should be discussed including typ capacity , and location of gear capable of containing and cleaning up accident spills at any point along the project, location, number, training and drills of clean-up personnel, and estimated response time and projected effectiveness of clean-up measures.

Adequate control of siltation during construction and of accidental spillage during operation is vital if this state's fishery resources are to be maintained. Several mitigative measures are mentioned in the text of this letter in other "General Comments". Additional measures may be developed on a stream by strea basis and presented as the State evaluation process proceeds.

49 ALTERNATIVES SECTION

The alternatives section of this EIS lacks sufficient detail to allow decision-makers to weigh the potential environmental implications of the alternatives. Of particular note in this regard is the "Cross-Sound" alternative which involv laying pipe from Port Williams immediately northwest of Sequim across to Whidbe Island north of Point Partridge and thence across Saratoga Passage and Camano Island to the mainland.

Considering the proponents' recent public statements regarding this alternative, the route, the techniques involved, the risks entailed and the resources at st should be considered in the same detail as described in this letter for the primary route dealt with by the EIS. More specifically, a list of information which should be included would include (but not necessarily be limited to) the following.

1. Quantified listing of harvest rates, economic values, and potential production of all fishery resources along the proposed alternate route.
    - a) Dungeness crab (Dungeness and Sequim Bays, Kilisut Harbor-Hadlo Saratoga Passage);
    - b) Subtidal geoducks along or adjacent to the route (in particular, Dallas Bank);
    - c) Clam and oyster farming in Sequim and Discovery Bays. (Discovery Bay has some of the most extensive hardshell intertidal clam beds under cultivation in the State);
    - d) Intensive commercial fishing for salmon (of particular note is the catches of Canadian Fraser River fish made in the area.);
    - e) Spawning herring populations in Sequim Bay Discovery Bays, Port Townsend, Kilisut Harbor, Mud and Hunter Bays (on Lopez Island), Skagit Bay, Duqualla Bay, and Holmes Harbor;
    - f) Extensive, very productive commercial groundfish harvest area surrounds the proposed alternate route. Trawling, hand-line jigging, trolling, set-net and set-line fishing takes lingcod, Pacific cod, dogfish and other groundfish between Point Partrid and Port Williams, in Port Townsend, Admiralty Inlet and Sarato Passage-Port Susan;
    - g. Egg, larval "fish" and juvenile rearing grounds for various groundfish including (but not limited to Pacific cod, lingcod, pollack, English sole, rock sole and sand sole;)
    - h. Surf smelt spawning area (Penn Cove, Sequim Bay, Discovery Bay, Kilisut Harbor, Camano Island and other areas);
    - i. Subtidal hardshell clam populations (these occur at various points throughout the area; of particular note are the very exte commercial beds in Kilisut-Port Townsend);
    - j. Salmon production in the new rivers crossed by the route;
    - k. Sea Urchins (Point Wilson, San Juan Islands).
    - l. Sea Cucumbers and Sea Abalone;
    - m. California mussels and commercial mussel farming (S. San Juans and Penn Cove respectively);
    - n. Soft shell clams (Port Susan);
    - o. Shallow water habitat and river estuaries used extensively by juvenile salmonids;
    - p. Octopus concentrations (Point Wilson, Middle Point, Partridge Point, Dallas Bank)
2. Analysis of the direct impact on the above species due to construction an operational impacts including mortality (adult & larval), tainting, disease susceptibility and harvest curtailment. Quantified assessment of economic implications of these impacts;
3. The location, type and historical failure rate of proposed block valve along the route;
4. The precise location of the pipeline on the most detailed scale of map possible;
5. The techniques proposed for constructing the pipeline including the type of pipe, the casing used, the depth and method of burying the pipe, the post construction configuration of the bluffs at Port Williams and Point Partridge (including the land-slippage potential and subsequent impacts).
6. The projected spill configurations east of Whidbey Island and their subsequent impact on fishery resources;
7. Projected maximum spills and amounts of undetectable leaks from various portions of the line;
8. Any complications entailed in detecting leaks in a submarine pipeline when water pressure outside the line equals flow pressure inside;
9. The potential for failure due to corrosion of the pipeline (internal or external);
10. The potential for failure due to large ships dragging anchor (how deep can the pipeline be buried and how deep would an anchor from a large ship "plow" if such a vessel were dragging anchor?);
11. Response time and clean-up capability which would be maintained in the ar

Map Addendum: The Map Addendum has a number of omissions and inaccuracies. We strongly recommend that the information be reviewed using Department of Fisheries publications.

We appreciate the opportunity to comment and look forward to working further with any oil transshipment proposals to ensure adequate protection of Washington's valuable foodfish resources and harvests.

Sincerely,

Gordon Sandison

Gordon Sandison, Director
DEPARTMENT OF FISHERIES

cc: OFM (Mike Mills, MS-AL01-6)
NMFS
USFWL
[illegible]
DOE
Washington State Association of Counties
EFSEC

Table 1. River and Stream Crossings Entailed in the Northern Tier Pipeline Project (around the Sound routes) *

| Stream | # in stream catalog | Tributary to | Salmon use |
|---|---|---|---|
| Siebert Creek | 173-18 | | coho (chum) |
| Pederson Creek | 163-18 | McDonald | (coho) |
| McDonald Creek | 160-18 | | (chin)-coho-pink-chum |
| Unnamed | 162-18 | McDonald | |
| Unnamed | 161-18 | McDonald | |
| Matriotti Creek | 21-18 | Dungeness R. | (coho)(chum) |
| Bear Creek | 30-18 | Dungeness R. | coho (chum) |
| Dungeness River | 18-18 | | Chin-coho-pink-chum; below hatchery water intake |
| Highland Ditch | 37-18 | Dungeness R. | Unknown; above natural anadromous fish use |
| Johnson Creek | 301-17 | | Unknown; above impassable cascades |
| Unnamed | 300-17 | | Unknown; above impassable cascades |
| Unnamed | 299-17 | | None; above impassable cascades |
| Unnamed | 297-17 | 299 | Unknown; above impassable cascades |
| Unnamed | 298-17 | 299 | None; above impassable cascades |
| Dean Creek | 293-17 | | (coho) (chum) impassable cascades in locale |
| Jimmy Come lately Creek | 285-17 | | coho-chum |
| Unnamed | 249-17 | Salmon Cr. | (coho)(chum) |
| Salmon Creek | 245-17 | | coho-chum |
| Unnamed | 253-17 | Salmon Cr. | Unknown |
| Unnamed | 254-17 | 253 | Unknown |
| Unnamed | 248-17 | | Unknown |
| Unnamed | 247-17 | | Unknown |
| Snow Creek | 219-17 | | coho-chum |
| Unnamed | | Lake Leland<br>Leland Creek | |
| Unnamed | 197-17 | | (coho) |
| ? | 118-17 | | |
| Little Quilcene R. | 76-17 | | chin-coho(pink)-chum |
| Big Quilcene R. | 12-17 | | chin-coho-pink-chum;below federal hatchery |
| Unnamed | 11-17 | | unknown |
| Unnamed | 7-17 | | Unknown |
| ? | 10-17 | ? | |
| ? | 9-17 | ? | |
| ? | 8-17 | ? | |
| ? | 5-17 | | |
| Spencer Creek | 4-17 | | coho-chum;in the area of impassable cascades |
| Marple Creek | 1-17 | | coho-chum;in the area of impassable cascades |
| Jackson Creek | 2-17 | Marple Cr. | None;in the area of impassable cascades |
| Turner Creek | 559-16 | | (coho)(chum) |
| Dosewallips R. | 442-16 | | chin-coho-pink-chum |
| Unnamed | 443-16 | Dosewallips R. | (coho)(chum) in the area of impassable cascades |
| Unnamed | 438-16 | | coho-chum |
| Duckabush River | 351-16 | | chin-coho-pink-chum; chum egg box site in the vicinity |
| Unnamed | 352-16 | Duckabush R. | |
| McDonald Creek | 349-16 | | coho-chum; above 2 impassable cascades |
| Fulton Creek | 332-16 | | coho-chum;above chum egg box site |
| ? | 331-16 | | above impassable falls |
| Unnamed | 327-16 | | none; above impassable falls |
| Schaerer Creek | 326-16 | | coho-chum; in area of impassable falls and cascade |
| ? | 328-16 | Schaerer Cr. | |
| Unnamed | 325-16 | | None; above impassable falls |
| Waketickeh Creek | 318-16 | | coho-chum; above impassable cascades |
| Hamma Hamma River | 251-16 | | chin-coho-pink-chum |
| John Creek | 253-16 | Hamma Hamma R. | coho-pink-chum; above chum egg box site, impassable falls in locale |
| Unnamed | 254-16 | | Unknown; impassable cascades in locale |
| Jorsted Creek | 248-16 | | coho-chum; above impassable cascades and falls |
| ? | 249-16 | Jorsted Cr | above impassable cascades |
| Eagle Creek | 243-16 | | coho-chum, above chum egg box site, above impassable cascades |
| Unnamed | 246-16 | Eagle Cr. | none; above impassable cascades |
| Lilliwaup Creek | 230-16 | | (chin)-coho-chum; above impassable cascades |
| Little Lilliwaup Cr. | 228-16 | | coho-chum; above chum egg box site |
| Sund Creek | 226-16 | | coho-chum, above impassable cascades |
| Miller Creek | 225-16 | | coho-chum, above passable falls |
| Clark Creek | 224-16 | | coho-chum; above impassable cascades |
| Finch Creek | 222-16 | | chin-coho-pink-chum; impassable cascades in locale; above Hoodsport Hatchery water intake |
| Skokomish River | 1-16 | | chin-coho-pink-chum; George Adams Hatchery water intake on Purdy Cr. which is tributary to Skokomish River below pipeline crossing |
| Weaver Creek | 6-16 | Purdy Cr. | coho-chum; see comments above |
| Goldsborough Creek | 35-14 | | chin-coho-chum |
| Coffee Creek | 36-14 | Goldsborough Cr. | coho |
| Gosnell Creek | 29-14 | Mill Cr. | (chin)-coho-chum; flows into Isabella Lake of which Miller Cr. is outlet |
| Little Creek | 21-14 | Skookum Cr. | coho-chum |
| Skookum Creek | 20-14 | | (chin)-coho-chum |
| Kennedy Creek | 12-14 | | (chin)-coho-chum; above chum egg box site |
| Perry Creek | 1-14 | | coho-chum; above impassable falls |
| McLane Creek | 138-13 | | coho-chum |
| Unnamed | 142-13 | McLane Cr. | coho(chum) |
| Black River | | | Inlet to Black Lake; intake for Percival Cove Pen rearing and Percival Creek are below pipeline crossing |
| Salmon Creek | -13 | Black River | See above |
| Unnamed | 40-13 | Deschutes River | Coho; inlet for Offitt Lake and tributary of Deschutes R.; intake for Deschutes spawning facility is below |
| Deschutes River | 28-13 | | chin-coho(chum); intake for Deschutes spawning facility is below |
| ? | 46-11 | Yelm Cr. | |
| Yelm Creek | 43-11 | Nisqually R. | coho-chum |
| ? | 47-11 | Yelm Cr. | |
| Yelm Ditch | -- | Yelm Cr. | |
| Centralia Canal | -- | | |
| Nisqually River | 8-11 | | chin-coho-pink-chum-sockeye |
| Murray Creek | 50-11 | Nisqually R. | (coho)(chum) |
| Unnamed | 24-11 | Lacamas Cr.-Nisqually R. | (coho)(chum) |
| Lacamas Creek | 22-11 | Muck Cr.-Nisqually R. | coho-chum |
| South Creek | 28-11 | Muck Cr.-Nisqually R. | (coho)(chum) |
| Unnamed | 595-10 | Puyallup R. | unknown |
| Puyallup River | 21-10 | | chin-coho-chum-pink |
| Fiske Creek | 596-10 | Puyallup R. | coho-chum |
| Unnamed | 415-10 | Voight Cr. | coho(chum); above impassable cascades |
| Copler Creek | 417-10 | Voight Cr. | coho(chum); above Puyallup Hatchery intake |
| Voight Creek | 414-10 | Carbon R. | chin-coho-pink-chum; above chum egg box site, above hatchery intake |
| Carbon River | 413-10 | Puyallup R. | chin-coho-pink-chum |
| Wilkeson Creek | 432-10 | South Prairie Cr. | chin-coho-pink(chum) |
| South Prairie Creek | 429-10 | Carbon R. | chin-coho-pink-chum |
| White River | 31-10 | Puyallup R. | chin-coho-pink-chum |
| Bosie Creek | 57-10 | White R. | coho(chum) |
| Newaukum Creek | 14-9 | Green R. | chin-coho-chum |
| Coal Creek | 126-9 | Fish Lake | ? |
| Deep Creek | 142-9 | Deep Lake | ? |
| Green River | 1-9 | | chin-coho-chum; Green River Hatchery water intake is on Soos Creek which is a tributary to Green R. below pipeline crossing |
| Cedar River | 299-8 | | chin-coho-sockeye; above sockeye and chum egg boxes |
| Walsh Lake Diversion | 341-8 | Cedar R. | coho(sockeye) |
| Carey Creek | | | |
| ? | | Carey Cr. | |
| ? | 407-7 | Deep Cr. Raging R. Snoqualmie R. | Above impassable cascades |
| ? | 406-7 | Deep Cr. Raging R. Snoqualmie R. | Above impassable cascades |
| ? | 402-7 | Deep Cr. Raging R. Snoqualmie R. | Above impassable cascades |
| Unnamed | 399-7 | Deep Cr. Raging R. Snoqualmie R. | Above impassable cascades |
| Raging River | 384-7 | Snoqualmie R. | chin-coho-pink(chum) |
| ? | 408-7 | Raging R. | |
| Unnamed | 469-7 | S.F. Snoqualmie R. | None; possibility of crossing 4 tributaries |
| Unnamed | 475-7 | S.F. Snoqualmie R. | None; possibility of crossing 4 tributaries |
| Unnamed | 483-7 | S.F. Snoqualmie R. | None; possibility of crossing 4 tributaries |
| Boxley Creek | 485-7 | S.F. Snoqualmie R. | None; possibility of crossing 2 tributaries |
| S.F. Snoqualmie River | 467-7 | Snoqualmie R. | None |
| Unnamed | 492-7 | S.F. Snoqualmie R. | None |
| Unnamed | 493-7 | S.F. Snoqualmie R. | None |
| Unnamed | 494-7 | S.F. Snoqualmie R. | None |
| S.F. Snoqualmie R. | 467-7 | Snoqualmie R. | None |
| Wood Creek | 496-7 | S.F. Snoqualmie R. | None |
| Alice Creek | 497-7 | S.F. Snoqualmie R. | None |
| Rock Creek | 501-7 | S.F. Snoqualmie R. | None |
| Harris Creek | 502-7 | S.F. Snoqualmie R. | None |
| Carter Creek | 504-7 | S.F. Snoqualmie R. | None |
| Hansen Creek | 505-7 | S.F. Snoqualmie R. | None |
| Humpback Creek | 512-7 | S.F. Snoqualmie R. | None |
| Olallie Creek | 514-7 | S.F. Snoqualmie R. | None |
| Unnamed | | Keechelus Lake<br>Yakima River | |
| Meadow Creek | | Keechelus Lake<br>Yakima River | |
| Unnamed | | | |
| Yakima River | | | Spring chinook spawning and rearing between Easton and CleElum |
| Cabin Creek | | Yakima River | |
| Big Creek | | Yakima River | |
| Little Creek | | Yakima River | |
| Reeser Creek | | Yakima River | |
| Wilson Creek | | Yakima River | |
| Naneum Creek | | Yakima River | |
| Coleman Creek | | Yakima River | |
| Cooke Creek | | Yakima River | |
| Trail Creek | | Yakima River | |
| Tekison Creek | | Columbia River | |
| Columbia River @ Cresent Bar i.e. above Priest Rapids | | | coho-spring chinook-fall chinook |
| Unnamed Canal | | Columbia River | crosses various canals numerous times |
| Rocky Ford Creek | | Moses Lake | |
| Crab Creek ? | | | |
| Canal | | | |
| Tributaries to | | | |
| Inlet to Sprague Lake | | | |
| Unnamed Creek | | | |
| Unnamed Creek | | | |
| Unnamed | | Downs Lake | |
| Unnamed | | Connects Downs and Williams Lakes | |
| Unnamed | | | |
| Unnamed | | | |
| Unnamed | | | |
| Unnamed | Bonnie Lake | | |
| Unnamed | Bonnie Lake | | |

Table 1. (continued)

| Stream | Tributary to | |
|---|---|---|
| Unnamed | Bonnie Lake | |
| Squaw Creek | | |
| Unnamed Creek | North Pine Creek | |
| North Pine Creek | | |
| Unnamed | | Numerous creeks between North Pine Creek and state boundary which are crossed. |

Table 2. River and Stream Crossings Detailed in the Cross Sound Alternative

| Stream | Catalog # | Salmon use | Tributary to |
|---|---|---|---|
| Siebert Creek | 173-18* | coho(chum) | |
| McDonald Creek | 160-18* | (chin)-coho-pink chum | |
| Unnamed | 24-18 | (coho) | Matriotti Cr. |
| Mariotti Creek | 21-18* | (coho)-chum | Dungeness River |
| Dungeness River | 18-18* | chin-coho-pink-chum | |
| Unnamed (Hurd Creek) | 28-18 | (coho) | Dungeness River |
| Cassalery Creek | 15-18 | (coho)(chum) | |
| Gierin Creek | 4-18 | (coho)(chum) | |
| Unnamed | 5-56 | unknown | |
| Unnamed | 56-6 | unknown | |
| Unnamed | 2-5 | unknown | |
| Stillaguamish River | 1-5 | chin-coho-pink-chum | |
| Church Creek | 19-5 | unknown | Stillaguamish River |
| ? | 20-5 | unknown | Church Creek |
| ? | | unknown | Sunday Lake |
| Unnamed | 130-5 | unknown | Armstrong Creek |
| Harvey Creek | 131-5 | coho | Armstrong Creek |
| N.F. Stillaguamish | 135-5 | chin-coho-pink-chum | Stillaguamish River |
| Unnamed | 320-5 | unknown | S.F. Stillaguamish River |
| Unnamed | 354-5 | none | S.F. Stillaguamish River |
| Unnamed | 357-5 | coho | S.F. Stillaguamish River |
| Little Pilchuck Cr. | 146-7 | coho(chum) | Pilchuck River |
| Star Creek | 153-7 | (coho) | Little Pilchuck Creek |
| Unnamed | 151-7 | coho | Little Pilchuck Creek |
| Stevens Creek | 147-7 | coho | Little Pilchuck Creek |

*Also crossed by the "Round the Sound" route although possibly in a different location on the stream or river.

| | | | |
|---|---|---|---|
| Pilchuck River | 125-7 | chin-coho-pink-(chum) | Snohomish River |
| Unnamed | 126-7 | coho(chum) | Pilchuck River |
| French Creek | 184-7 | coho | Snohomish River |
| Unnamed | 186-7 | coho | French Creek |
| Unnamed | 188-7 | unknown | unnamed-186 |
| Skykomish River | | chin-coho-pink-chum | |
| Riley Slough | 818-7 | coho(chum) | Skykomish River |
| Peoples Creek | 236-7 | coho | Snoqualmie River |
| N.F. Cherry Creek | 243-7 | chin(chum)(pink) | Cherry Creek |
| Cherry Creek | 240-7 | chin-coho-pink(chum) | Snoqualmie River |
| Tolt River | 291-7 | chin-coho-pink(chum) | Snoqualmie River |
| Griffin Creek | 364-7 | chin-coho-pink(chum) | Snoqualmie River |
| Tokul Creek | 440-7 | chin-coho(pink) | Snoqualmie River |
| Brockway Creek | 464-7 | none | Snoqualmie River |
| Tate Creek | 529-7 | none | N.F. Snoqualmie River |
| N.F. Snoqualmie River | 527-7 | none | Snoqualmie River |
| M.F. Snoqualmie River | | none | Snoqualmie River |

S.F. Snoqualmie River is the last crossing on the around the sound route before joining the cross sound alternative route just east of North Bend

**141** CONT.

Table 3.

Commercial Bottomfisheries by Marinefish/Shellfish Areas

| Area | Type of fishery | Target species |
|---|---|---|
| 26 | Minor trawl<br>Major set line & set net<br>Bottomfish troll & handline jigging | All groundfish<br>Cod & Dogfish<br>Lingcod |
| 25A | Same as Area 26 with more significant trawl fishery | Cod, Dogfish, Lingcod & All other groundfish |
| 25B | Same as area 25A with no trolling for bottomfish | Cod, Dogfish, Lingcod & All other groundfish |
| 27A | Minor trawling<br>Significant set line & set net for dogfish<br>Drag seine for sea perch | Groundfish<br>Dogfish<br>Sea Perch |
| 27B<br>27C | Beach Seining for sea perch | Sea Perch |
| 28C | Minor trawling<br>Significant set net & set line for dogfish<br>Drag seine for sea perch | Groundfish<br>Dogfish<br>Sea Perch |
| 28D<br>28A | Same as Area 28C | Goundfish<br>Dogfish<br>Sea Perch |

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**142**

From: Richard C. Kerr II
Eureka Ranger Station
Eureka, Montana
59917

March 27, 79
Eureka, mt
142

To: Bureau of Land Management
(Portland, Oregon)

Subject: Comments in opposition to the proposed construction of the Northern Tier Pipeline.

Listed below are reasons why I oppose the Northern Tier Pipeline proposal(s).

① As an energy conservationist, I oppose the Northern Tier Pipeline (N.T.P.) proposal because:
(1) No where does the N.T.P. company mention or encourage the conservation of energy (crude oil) in its Draft Environmental Statement (D.E.S.). The conservation of crude oil should have been a serious alternative included in the N.T.P. Company's D.E.S. Having an exhaustable resource such as crude oil and having consumers paying "out of their noses" for oil products and by-products, how can the N.T.P. Company refer to the crude oil they will transport as "surplus" oil? It's time, a time over-due, that Americans realize they can't continue to be energy "hogs" as in the past. I think the American people are ready to reduce their energy demands ... but, will the American oil companies and power companies let us?

① CONT. As an environmentalist and an economist, I oppose the N.T.P. proposal because:
(1) Modifying existing West Coast refineries for the heavy sulfur Alaskan oil would:
(a) be more intelligent, (b) greatly lessen environmental impacts (i.e. the Rocky Mtn.s represent a serious and fragile barrier), & (c) cost only a fraction (in monetary terms, and in energy terms) of building a pipeline much longer than the Alaskan Pipeline (which had great scandals, created devastating environmental impacts, and which eventually costed much more than original cost estimates).
(2) Even the idea of swapping Alaskan oil for foreign oil (i.e. Mexican oil purchased by Japan) would be much more favorable ... as for reasons stated above. My only opposition to this alternative would be perhaps the increased chance of oil spills by oil tankers.

As an honest and trustworthy member of the American Public, I oppose the N.T.P. proposal because:
(1) I believe the N.T.P. Company's pipeline proposal is the "second-half" or continuance of the greatest scandal in American History ... the Alaskan Pipeline (brought about by phony oil-gas shortages by American oil companies and power companies). I further believe this "second-half" pipeline construction was fully realized when the Alaskan Pipeline was planned. Why do I believe this? (a) the American people were out-right told that the crude oil carried on the Alaskan pipeline would be refined by West Coast refineries ... now we are told it's too heavy in sulfur to be refined by West Coast refineries.
(2) Regulations governing the construction of the Alaskan Pipeline were not enforced, resulting in preventable pipeline construction scandal and preventable environmental devastation (i.e. oil leaks, pump station explosion and another near explosion of another pump station, erosion, streambed destruction & fish habitat destruction, unusable wildlife crossings over/under the pipeline, and preventable loss of wildlife habitat to mention a few examples).
* Yet *, the N.T.P. Company doesn't even have half the important regulations (used on the Alaskan Pipeline Construction) for "safe" pipeline construction in writing to the American people and landowners! Haven't we learned anything from the construction of the Alaskan Pipeline?? I'm afraid not.
(3) I believe the mining Companies associated with Colstrip 3 & 4 in Montana are supporting the N.T.P. proposal so they will have an already built right-of-way

CONT. corridor for energy transmission facilities (since the pipeline would be a "common carrier" for different oil companies, the N.T.P. Co. will be able to use power of eminent domain to condemn private land for pipeline right of way. Most of the pipeline route is on private land). Have these mining companies been so bold as to tell the public their true ambitions? I rather doubt it.

As a wildlife biologist and a Montanan, I oppose the N.T.P. proposal because:
(1) Of the devastating impacts of the Alaskan Pipeline construction on wildlife and plants, and their respective habitats. One look at the Federal Endangered & Threatened Species list will only show a steady increase of new species, and worsening ratings for species already listed previously.
(2) I believe most people from the Midwest don't even realize where or how their energy supplies are originated ... why should Montana have to sacrifice its very unique offering to the rest of the country (clean air, clean water, beautiful country, wildlife, and outdoor recreation opportunities), for the devastating impacts of fulfilling the energy needs of the Midwest (& west coast and the East!), all of which can be and should be fulfilled from other sources and means (as previously discussed). Also, the Midwest fuel demands are currently being met quite adequately by oil tankers carrying Alaskan oil thru the Panama Canal and to gulf ports. In fact, Minnesota has expressed little, if no need, for the N.T.P. proposal. People of Montana value and appreciate what they have ... and will fight to keep it that way.

I have traveled in the mid-west and Eastern states, and know the blunders mechanized man brings ... lies, broken promises, abuse of nature, boom & bust situations, ... reap and leap attitudes, leaving devastation for the local people to live/suffer with. So let it be recorded that at least one human being (a self-appointed representative of the true "silent" majority, wildlife, and its environment nature) didn't have the "wool pulled over his eyes" without knowing it ... fighting it.

And I end my comments concerning

CONT. the N.T.P. Company's proposal with a quote from Leopold (1949):

"We abuse land because we reguard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to see it with love and respect. There is no other way for land to survive the impact of mechanized man ..."

Sincerely,
Richard C. Kerr II

**143**

*WASHINGTON TROLLERS ASSOCIATION*

P. O. Box 17331
Seattle, Washington 98107
(206) 789-2607

RECEIVED
APR 2 1979
Bureau of Land Management
Spokane, Wa.

28 March 1979

Bureau of Land Management
Spokane District Office
West 920 Riverside
Spokane, Washington 99201

SUBJECT: Comments on the Draft Environmental Statement, Crude Oil Transportation System, (Northern Tier)

We categorically oppose the incursion of any oil terminal facilities that would further threaten the delicate ecosystem upon which our salmon depend and further hasten the decline of these endangered stocks.

Specifically, we object to the Northern Tier proposal for the following reasons:

1. The immediate damage from siltation to salmon rearing streams and turbidity to surrounding waters that's involved in laying a pipeline. Streams could take up to 20 years to recover as the Draft reports.
2. The long term threat of an oil spill that would not only threaten the habitat and downstream migration of juvenile salmon, but severely disrupt fishing operations and create immediate and long term financial losses to our industry.
3. The increased navigational hazards from the addition of 3 to 4 hundred super tankers per year is intolerable.
4. The Cross Sound pipeline that permits up to 4660 barrels a day to spill undetected is untolerable. It is reported that entrainment failure is very large at 1.2 to 1.5 knots. Thus, there will be practically zero chance of entrainment of Cross Sound spills where ebb currents consistently reach 1 to 3 knots.
5. The total disregard of financial responsibility on the part of oil interests. If above all objections, the oilport is forced upon us, then those who stand to profit from it must be required to post bonds that would compensate both the Fishermen for their losses and the state for its costs in rehabilitating loss runs of salmon.

Additionally, we find the following problems with the Draft itself:

① 1. Installation risks and potential hazards from the Cross Sound route have not been adequately addressed. Nor are the engineering problems that will be associated with moving highly viscous oil through subfreezing water at extremely high pressures addressed.

② 2. Local knowledge of wind and currents indicates that computer models may have overemphasized wind vectors and minimized the fact htat currents in the Straits of Juan de Fuca generally are ebbing about 18 hours a day, and, therefore, the probability that an oil spill will move into the open ocean and be shunted down the pristine Washington Coast is very high and should be addressed.

Sincerely,

Greg Bloom

Greg Bloom for
Paul Thomas
Washington Trollers Association

PT:GB:bmac

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**144**

R. R. 6, Box 6009-11
Juneau, Alaska 99801
March 28, 1979

Bureau of Land Management
Oregon State Office
729 N. E. Oregon Street
Portland, Oregon 97208

Gentlemen:

As an Alaskan resident and taxpayer, I am currently opposed to the construction and operation of an oil pipeline from Skagway, Alaska, into the Yukon Territory. I am of the opinion that the preparation for construction of that pipeline is inadequate and that studies as to its environmental, economic, and social impact have not been thoroughly or properly conducted, if at all. Due to recent developments and preparation for the discontinuation of the White Pass and Yukon Route Railroad by its owner company (with which Foothills Pipeline Company has consolidated), combined with the hurried manner in which BLM has conducted its approach to the proposed pipeline route, I feel that the acceptance and implementation of this proposal is being shoved down my throat. That gags me.

I am concerned for the economic stability of Alaska's future, for our fishing industry, for the beauty of our scenery, and for the preservation of historical areas and artifacts. I enjoy having the summer tourists come to Alaska every year and want to continue sharing the unique qualities of our state with them.

① Since I have not been made aware of results of any preliminary studies which should obviously have been conducted. I am confused as to the accuracy and thoroughness of public comment which you may expect. You seem to be looking for public concern, rather than informed public opinion as to the desirability of one proposed pipeline route over another. I am, therefore, directing the following concerns toward the Foothills' proposal in order that we Alaskans may be better informed and judge its feasibility and desirability.

In order to formulate my opinion, I would like to know the following:

② 1. What effect will tanker traffic and potential oil spills have on Alaska's

--fishing industry;

--migratory patterns and future populations of fish, marine mammals, and other marine life;

--birds and other wildlife in Southeast Alaska;

--scenic beauty of Southeast Alaska's land and water;

--shoreline vegetation?

③ 2. What effect will construction and maintenance of the proposed pipeline have on the historical area and artifacts which remain within the historical park area of Mile 12 to Mile 21?

④ 3. How will tanker traffic and potential oil spills effect Alaska's tourism industry, on which not only the citizens of Skagway depend, but also the citizens of all Southeast Alaska?

⑤ Assuming construction of the pipeline will require the discontinuation of the WP&YR Railroad (the last narrow guage railroad in America and a major drawing attraction for tourists), how will our tourism industry be affected by the cessation of passenger service on the railroad?

⑥ Though not the concern of the Bureau of Land Management directly, I am also concerned as to what other routes will be used by shipping companies if the WP&YR railroad ceases operation. Will companies such as Cyprus Anvil Mining Company be forced to use the Klondike Highway? If so, I fear Alaskans may be cooerced into paying for upgrading and year-round maintenance of that road as required by the additional and more regular use of freight shipping and automobile traffic.

It is my sincere hope that you will again solicit public opinion when some basic questions have been answered.

Very truly yours,

Marsha A. Helton

Marsha A. Helton

cc: Hearing Management
Department of Energy
Box WY
Washington, DC 20461

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**145**

McHENRY & STAFFIER
ATTORNEYS AT LAW
SUITE [illegible]
[illegible] CONNECTICUT AVENUE, N. W.
WASHINGTON, D. C. [illegible]

GEORGE W. McHENRY, JR.
JOHN [illegible] STAFFIER

April 2, 1979

AIR MAIL
SPECIAL DELIVERY

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250
Lloyd Building
700 N.E. Multnomah
Portland, OR 97232

Dear Sir:

Enclosed herewith are twenty-five (25) xerox copies of the Comments of Foothills Oil Pipe Line Ltd. on the Draft Environmental Impact Statement issued on January 11, 1979, for the Northern Tier Project. Printed copies will be mailed to you tomorrow.

Your immediate attention is directed to Part 1 of our comments. In that section, we have outlined those procedures which, in our judgment, must be followed in order to provide due process to all applicants under Title V of the Public Utility Regulatory Policies Act of 1978.

Sincerely yours,

George W. McHenry, Jr.

GWM:vad
Enclosures
cc: Gary Wicks
Dick Miller

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**CONT**

BEFORE THE
UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
IN RE
THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE NORTHERN TIER PIPELINE PROJECT

COMMENTS OF
FOOTHILLS OIL PIPE LINE LTD.

BEFORE THE
UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
IN RE
THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE NORTHERN TIER PIPELINE PROJECT

COMMENTS OF
FOOTHILLS OIL PIPE LINE LTD.

Foothills Oil Pipe Line Ltd. (Foothills) hereby respectfully comments on the Draft Environmental Statement (DES) issued on January 11, 1979, by the Department of the Interior (DOI) regarding the crude oil transportation system from Port Angeles, Washington, to Clearbrook, Minnesota, proposed by Northern Tier Pipeline Company (NTPC). As more fully discussed below, Foothills and Northwest Energy Company (Northwest) are co-sponsors of the Alaska Highway Oil Pipeline Project, a competing proposal to transport crude oil from Alaska and foreign sources through Canada to markets in the northern tier and inland states. Northwest submitted an application to the Secretary of Interior on December 8, 1978, pursuant to Title V of the Public Utility Regulatory Policies Act of 1978 (PURPA), for authorization to construct and operate the United States segments of the Alaska Highway Oil Pipeline Project. Foothills will shortly file its application with the National Energy Board in Canada seeking the requisite authorizations for the Canadian segments of the system.

These comments include three parts. Part I addresses the substantive and procedural requirements of the selection process established by Title V of PURPA and presents Foothills' position as to the proper role of the January 11 DES in that process. Part II describes the Alaska Highway Oil Pipeline Project and its significant comparative advantages vis-a-vis the NTPC proposal as a means for delivering Alaskan and foreign crude oil to northern tier and inland states. Part III is a section by section critique of the January 11 DES.

① I.

SUBSTANTIVE AND PROCEDURAL REQUIREMENTS UNDER TITLE V

As set forth in the DES, NTPC filed its application with DOI for a pipeline right-of-way across Federal lands, pursuant to the Mineral Leasing Act of 1920, as amended, in April 1977. That application triggered the environmental review process which ultimately culminated in the January 11 DES. In November 1978, however, prior to the issuance of the DES, the Public Utility Regulatory Policies Act of 1978, was enacted into law. In Title V of that statute, titled "Crude Oil Transportation Systems", Congress, recognizing the urgent need to alleviate the current West Coast crude oil surplus and to ensure a reliable supply of crude oil to northern tier and inland states, established expeditious procedures for the selection of an appropriate delivery system designed to resolve these problems. Pursuant to Title V, applications for various crude oil transportation systems have been filed by NTPC, Northwest, TransMountain Pipeline Company Ltd., and Kitimat Pipeline Ltd.

Despite NTPC's procedural headstart, it is clear that each of the four Title V applicants is entitled to fair and equal treatment in the selection process established by that statute. Congress has invited the filing of competing proposals with the obvious intent of discovering and selecting the delivery system best able to resolve the current West Coast crude oil surplus and to ensure a reliable supply of crude oil to northern tier and inland states. Inherent in that purpose is the requirement that all applicants responding to the invitation be treated on an equal basis. See, e.g., Ashbacker Radio Corporation v. F.C.C., 326 U.S. 322 (1945). Anything less would effectively deny the disadvantaged applicants of "the opportunity which Congress choose to give [them]". Id. at 333. In addition, of course, Congress was presumably fully aware of NTPC's preexisting Mineral Leasing Act application when it enacted Title V, and it, nevertheless, invited additional proposals. Certainly, Congress would not have enticed other applicants to go to the trouble and considerable expense of participating in the Title V selection process, had it anticipated that they would be relegated to second-class status as a result of NTPC's preexisting application. It would be anomalous, indeed, for applicants who have submitted timely filings under Title V, and conformed in all respects to the various other requirements of that statute, to nevertheless be saddled with a permanent stigma, vis-a-vis NTPC. In short, fair and equal treatment of all bona fide applicants is the implicit assumption supporting Title V, without which the statute makes no sense.

From the outset, the Department of Interior has assured Northwest and Foothills, as the co-sponsors of one of the four competing Title V applications, that it intends to treat all applicants on an equal basis, and we have no reason to doubt the sincerity of DOI's intentions. As set forth below, however, Foothills is convinced that the procedures adopted by DOI for processing the Title V applications and related impact statements will not permit the achievement of that goal.

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As referenced above, DOI's draft environmental analysis of the NTPC project, which was initiated as a result of that company's April 1977 Mineral Leasing Act filing, was virtually complete in November 1978, prior to the filing of the four competing Title V applications. That document obviously included a lengthy and detailed first-cut assessment of the NTPC proposal. Comparable assessments of the systems applied for under Title V by Northwest, TransMountain and Kitimat, however, had obviously not yet even been initiated, much less completed, and were thus not included. The first major procedural question which DOI was forced to confront, therefore, in the aftermath of the passage of Title V and the submission of the four competing applications thereunder, was whether to proceed with the publication of its virtually completed draft assessment of the NTPC project or to withhold that document for simultaneous publication with comparable assessments of the three competing proposals. This question was resolved by the issuance of the NTPC DES on January 11, 1979.

The January 11 draft statement focuses almost entirely on the NTPC project. Title V itself is only briefly referenced in the document (see, pp. I-58 - I-59), and none of the applications filed pursuant to that statute are identified or discussed. Indeed, the DES suggests that no applications were submitted under the Title V procedures (Ibid.). Although neither the Northwest, TransMountain, nor Kitimat Title V applications are referenced in the January 11 DES, facsimiles of the systems sponsored by each of those applicants are discussed briefly as "alternatives" to the NTPC proposal. We cannot speak for the latter two projects. We submit, however, that the description in the "alternatives" Section of the DES of the Alaska Highway Oil Pipeline Project is not only cursory, but is inaccurate and misleading. Given that DOI's abbreviated assessment of our proposal was prepared without the benefit of our Title V application and supporting documentation, that unsatisfactory result was, perhaps, inevitable.

It is readily apparent that the January 11 DES, by relegating the Northwest, TransMountain, and Kitimat proposals to the second-class status of "alternatives", and by presenting an overly brief, inaccurate and misleading description at least of Northwest's project, serves to substantially downgrade those three Title V proposals, vis-a-vis that of NTPC. Nevertheless, it is our current understanding that DOI has no plans to even attempt to rectify this discriminatory approach by issuing a new draft environmental statement. On the contrary, as we understand it, the next document that will be issued by DOI regarding crude oil transportation systems will be its final Environmental Statement. That document will be issued in August 1979 along with the recommendations of DOI and the other Federal agencies: The final statement, as well as the agency recommendations, will be available for public comment for a thirty-day period. Unfortunately, however, those comments will not result in a modification of the impact statement which will already be in final form.

Foothills is mindful of the need to expedite the selection process under Title V. To that end, we have cooperated with DOI and the other involved agencies to the fullest possible extent and have, at great expense, submitted information on a timely basis. We cannot, however, accept without protest the procedures outlined above, because they fail to provide our project with the equal treatment and due process to which we are entitled under Title V. Those procedures are unfair to all of the Title V applicants, other than NTPC, for the following reasons:

(1) The designation of our project as a mere "alternative" to the NTPC proposal in the January 11 DES creates the unavoidable impression in the public eye that our project is a mere afterthought, which is being discussed only for the purpose of meeting the minimal requirements of the National Environmental Policy Act. Far from being equal in status to the NTPC proposal, our project is thus portrayed as a "tail" being wagged by the NTPC "dog". Needless to say, in a competitive selection process, such as that created by Title V, it is a severe disadvantage to any competitor to be perceived as being of less than equal status, with an opponent.

(2) The abbreviated, inaccurate, and misleading analysis of our project in the January 11 DES precludes even the most objective of readers from making a fair evaluation of the relative merits of our project, vis-a-vis those of the other applicants. That document, under present plans, will constitute the only discussion of our project available to the public during the critical period between now and August when interested parties will be formulating their positions. Therefore, even if the final statement, includes an accurate assessment of our proposal, it will be too late to be of use. Public views and perceptions will have already crystallized, on the basis of the incomplete presentation in the January 11 DES.

(3) As a result of the DES, NTPC will have the opportunity through its comments, to correct any errors in DOI's first-cut assessment of its project, before a final statement is published. Since a supplemental draft is not planned, we and the other Title V applicants will not have a similar opportunity. We will not be apprised of DOI's initial assessment until we read it in the final statement. Our opportunity to submit comments after the final statement is issued is of little solace, since such comments will be filed after DOI and the other involved agencies have already formulated their views and published their required recommendations.

(4) Since the January 11 DES does not apprise the public of the existence of our application, interested parties who may be generally aware of our proposal, might well be unaware that comments on our project should be filed now. If our project were ultimately selected, such parties would be in a good position to challenge the selection process on the grounds that they were effectively denied the right to present their views. 1/ The same argument, of course, would not lie with respect to the NTPC proposal. In short, therefore, the procedures adopted by DOI make selection of our project more vulnerable to judicial reversal on procedural grounds than selection of the NTPC project. This disadvantage could obviously create a bias against our project in the minds of the ultimate decisionmakers.

For the foregoing reasons, Foothills submits that the procedures presently proposed by DOI for implementing Title V of PURPA must be modified in at least two important respects. First, DOI must, prior to the issuance of its final environmental statement, publish in draft form its initial assessment of the proposals filed under Title V by Northwest, TransMountain and Kitimat. Such a draft is necessary to inform the public of the existence and nature of these proposals, and to provide an effective basis for the formulation and submission of comments thereon by the applicants and other interested parties. Without an effective notice and comment process, equal treatment of all Title V applications in DOI's final statement will be impossible. Second, when the final statment is issued, all Title V applicants should be identified and treated as applicants. Discussion of the Northwest, TransMountain and Kitimat proposals should not be placed in the "alternatives" section of the document. Again, we emphasize that our concerns in this regard are not petty. Nomenclature and organizational format in any document can create

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bias just as surely and effectively as explicit discriminatory language.

We believe that the procedural recommendations set forth in the preceding paragraph are the minimum necessary to insulate the Title V selection process from successful judicial challenge either by an aggrieved applicant on the grounds of discriminatory treatment, or by other interested parties, on the grounds of denial of an effective opportunity to submit substantive comments. We urge, however, that, in considering the recommendations, DOI resist the temptation to focus solely upon the need to protect its ultimate decision from judicial reversal. The purpose of Title V is not to test the limits of DOI's powers to treat competing applicants differently, but rather to solicit the information necessary to select the delivery system best suited to alleviate this country's current crude oil transportation problem. Accordingly, procedures such as those presently contemplated by DOI, which will frustrate rather than promote an objective investigation of the problem and the possible solutions, would not serve the public interest, even if they were conceded to be sufficient to withstand judicial scrutiny.

## II.

## THE ALASKA HIGHWAY OIL PIPELINE PROJECT

### A. Background and Project Description

The experience of Northwest and Foothills in the area of northern pipeline construction is unparalleled. Northwest owns several subsidiaries, including Northwest Pipeline Corporation, which operates an extensive natural gas transmission system extending throughout the states of Washington, Oregon, Idaho, Wyoming, Utah, and Colorado. The corporate parents of Foothills, Alberta Gas Trunk Line Company Limited (AGTL) and Westcoast Transmission Company Limited (Westcoast), are two of the three major natural gas transmission companies in Canada and together have constructed over 7,500 miles of gathering lines and large-diameter main lines in western Canada. Almost 80 percent of the gas produced in Canada and virtually all of the 2 1/2 billion cubic feet of gas which is exported daily to the Untied States is transported through the extensive pipeline networks that AGTL and Westcoast own and operate, respectively, in the Provinces of Alberta and British Columbia. In addition, Westcoast owns and operates a major oil transmission system.

Since the first discoveries of oil and natural gas reserves in the Arctic, these companies have been involved in studies to determine the best means of transporting these reserves to markets in southern Canada and the United States. As a consequence of these continuing studies, Northwest, Foothills, AGTL, and Westcoast proposed in 1976 the construction of the Alaska Highway Gas Pipeline Project, which was ultimately chosen by the governments of the United States and Canada as the most economic and environmentally sound means of transporting Prudhoe Bay gas to markets in the lower forty-eight states.

Being geographically situated as a natural link between Alaska and the lower forty-eight states, and having unparalleled expertise in the construction and operation of hydrocarbon pipelines in northern terrain, Northwest and Foothills conducted studies in early 1978 to determine the most economic and environmentally sound means of transporting surplus Alaskan crude oil to the northern tier and inland states. As a result of these studies, on December 8, 1978, Northwest formally filed its application under Title V of PURPA to construct and operate a crude oil transportation system to carry Alaskan north slope and foreign oil from Skagway, Alaska, to Keg River, Alberta, and thence by existing oil systems to U. S. markets. Since the application was filed after the completion of the DES for NTPC, it will be helpful to briefly describe the salient features of the project.

The prime proposal of Northwest and Foothills contemplates that approximately 400,000 barrels of heavy Alaskan crude oil and 100,000 barrels of light offshore crude oil would be delivered daily to the port of Skagway, Alaska, via ocean-going tankers of various sizes. It is expected that the Alaskan crude from Valdez would be shipped in tankers ranging from 80,000 to 160,000 dead weight tons (dwt); offshore oil could be delivered in tankers as large as 270,000 dwt.

To receive and unload the tankers, marine terminal facilities would be constructed at Skagway, approximately 1500 feet south of an existing cargo dock. From these facilities, the oil would be transported in a short, 42-inch (O.D.) pipeline to a tank farm having a storage capacity for approximately one million barrels of light crude and three million barrels of heavy crude.

The proposal also calls for the construction of a new 710-mile, 34-inch pipeline, having a capacity of 500,000 barrels per day, to connect the terminal and storage facilities at Skagway with existing pipeline facilities at Keg River, Alberta. The vast majority of this pipeline (consisting of 14 miles in Alberta, 394 miles in British Columbia, 246 miles in the Yukon Territory, and 57 miles in Alberta) would follow the existing rights-of-way of the White Pass and Yukon Railway and the Alaskan Natural Gas Transportation System, which, in turn, follows the Alaska Highway. South of Keg River, the oil would be transported through existing oil pipelines, upgraded as necessary.

The capital cost of the Alaska Highway Oil project was estimated in the December 8, 1978 application to be $877 million (1978 U.S. dollars). A subsequent reassessment confirmed that the original cost estimates were within five percent, and were, therefore, reasonably accurate from the outset. Nevertheless, we have now adopted the updated estimate of $919 million (1978 U.S. dollars) as the likely capital cost of the project. This recent reevaluation of the project also examined the NTPC proposal and revealed that the capital cost estimates made by NTPC are unrealistically low. As we will discuss more thoroughly below, the Foothills assessment of NTPC's costs is consistent with a recent decision of the Minnesota Energy Agency which also questioned the economic viability of the NTPC project. 2/

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Northwest and Foothills estimate that the project can be completed and in operation within two and one-half years following the receipt of all Federal, State, and Canadian regulatory approvals. This schedule is reliable for at least three reasons. First, the construction would take place along existing rights-of-way which provide ready access for men, equipment, and materials. Second, much is already known about the terrain since construction has already taken place, or has been studied extensively, over most of the route. Finally, the companies sponsoring the project have a strong background and experience in pipeline engineering and construction in the northern terrain.

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One final point of clarification is necessary concerning the status of the project. The DES (pp. 8-101) appears to suggest that the project is somehow affected by the September 1978 Energy Supply and Demand Study of the Canadian National Energy Board. That study, among other things, found that additional Canadian port facilities were not necessary to meet Canadian demand for crude oil. This conclusion, while perhaps relevant to the Kitimat proposal, has no bearing on the Alaska Highway Oil proposal which is to construct a port in the United States at Skagway, Alaska, for the receipt of Alaskan and offshore crude oil to be transported to the lower forty-eight states.

### B. Major Comparative Advantages to the Alaska Highway Oil Pipeline Project

#### (1) Environmental Impact

The Alaska Highway Oil Pipeline would have two significant environmental advantages over the Northern Tier project. First, as indicated above, a vast majority of the 710 miles of new pipeline between Skagway and Keg River would follow the existing rights-of-way of the White Pass and Yukon Railway and the Alaska Natural Gas Transportation System. As a result, the environmental impact of constructing and operating the oil pipeline will be minimized. In addition, the project will conform in all respects to the mandate of Section 28 of the Mineral Leasing Act, as amended, which declares that (30 U.S.C. 185):

> "In order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical ...".

The second environmental advantage stems from the simple fact that Skagway is much closer to Valdez than either Kitimat, British Columbia, or Port Angeles, Washington. As a result, tanker traffic on the western shores of Canada and the United States, as well as the risks of oil spills, will be greatly reduced.

In contrast to the Alaska Highway Oil Pipeline, Northern Tier would increase oil tanker traffic, comparatively, and would require a new right-of-way through previously unspoiled, virgin terrain for a majority of its 1557-mile pipeline. Needless to say, this would contravene the spirit, if not the letter, of Section 28 of the Mineral Leasing Act.

#### (2) Economics

As indicated in Table 3 to these comments, Northern Tier's filed capital cost was based upon an assumed pipeline construction cost of only $648,000 per mile. Since this figure is unrealistically low in comparison to the cost per mile which is projected by other pipelines for similar construction, Foothills has reestimated Northern Tier's cost to be approximately $1.674 billion. 3/ In comparison, the new estimate for the Alaska Highway Oil Pipeline Project is approximately $920 million.

With lower capital costs and a shorter distance for the tanker portion of the route, Foothills estimates that the Alaska Highway Oil Pipeline Project can transport Alaskan oil from Prudhoe Bay to Chicago for approximately $8.28 per barrel, as compared to $8.59 to $9.19 per barrel for Northern Tier. 4/ If the Delta Junction Alternative were selected, the transportation charge would be $5.94 to $8.44, depending on the extent to which Northwest and Foothills would be required to pay for a segment of the Alyeska service between Delta Junction and Valdez.

To the extent that Northwest and Foothills can transport Alaska oil to markets at a cheaper rate than NTPC, the netback to Alaska producers is increased. This netback can be translated into additional exploration and development which, in turn, may contribute to the growth of domestic reserves and a reduction in the nation's dependence upon imported oil.

Other advantages to the Alaska Highway Oil Pipeline Project are set fort in the Northwest application which was filed on December 8, 1979. For purposes of this document, however, we will not reiterate that discussion. We will turn, instead, to the section-by-section critique of the DES.

CONT

TABLE 1
ALTERNATIVE TRANSPORTATION SYSTEMS: WEST COAST TO CHICAGO

COMPARATIVE CAPITAL COSTS & TRANSPORTATION COSTS TO CHICAGO
(TEN-YEAR AVERAGE, 1978 U.S. DOLLARS/BARREL)

| Project | Pipeline Mileage | Pipeline Diameter | Throughput | Project Capital Costs | Cost of Transportation $/bbl.<br>New Project | Alyeska | Other Existing Pipelines | Shipping | Total |
|---|---|---|---|---|---|---|---|---|---|
| Foothills: | | | | | | | | | |
| Skagway Alternative | 710 | 34" | 500Mbbls/d | $920 MM | 1.09(1) | 6.16(2) | 0.69(3) | 0.34(4) | 8.28 |
| Delta Junction Alternative: | | | | | | | | | |
| a) w/full Alyeska Tariffs | 1139 | 34" | 500Mbbls/d | 1,370 MM | 1.60(1) | 6.16 | 0.69 | 0 | 8.44 |
| b) w/reduced Alyeska Tariff | 1139 | 34" | 500Mbbls/d | 1,370 MM | 1.60 | 3.66(5) | 0.69 | 0 | 5.94 |
| Northern Tier - filed | 1576 | 40"/42" | 700Mbbls/d | 1,147 MM | 1.46(6) | 6.16 | 0.07(7) | 0.65(8) | 8.34 |
| Northern Tier - Foothills Re-Estimate | 1576 | 40"/42" | 700Mbbls/d | 1,674 MM | 1.71(9) to 2.31 | 6.16 | 0.07 | 0.65 | 8.59(9) to 9.19 |
| Trans Mountain-Foothills Estimate | — | 36" + 30" loop | 500Mbbls/d | 683 MM(10) | 1.05(11) | 6.16 | 0.28(12) | 0.65 | 8.14 |
| Panama Canal | — | — | — | — | — | 6.16 | [illegible](13) | [illegible](14) | [illegible] |

(1) Foothills tariff based on 75/25 debt equity ratio, 16% return on equity, 25 yr. facility life, normalized income tax.
(2) Alyeska tariff from Prudhoe Bay to Valdez.
(3) Foothills estimate of tariff from Keg River, Alberta to Edmonton, Alberta plus IPPL 10-yr. average tariff from Edmonton to Chicago, Illinois for the 10 yrs. following 1982, discounted to 1978 dollars.
(4) Estimated tanker rate per barrel from Valdez to Skagway.
(5) If Alyeska charges could be reduced to only those applying to the line segment from Prudhoe Bay to Delta Junction, a savings of some $2.50 per barrel would result, making the applicable Alyeska tariff equal to $3.66 ($6.16 minus $2.50).
(6) Northern Tier filed tariff based on Jan. 1/77 dollars, 12% return on rate base and throughput of 730,000 B/D, was $1.36 to Clearbrook, Minnesota. To reflect it in 1978 dollars, it was escalated by 7% to $1.46.
(7) Foothills estimate of tariff from Clearbrook, Minnesota to Chicago, Illinois in 1982 dollars discounted to 1978 dollars.
(8) Estimated tanker rate per barrel from Valdez to Port Angeles, Washington.
(9) Foothills estimate based on capital cost re-estimate done internally, and using cost of service methodology similar to that used for Foothills project. Even though the throughput volumes used by Northern Tier are considered to be too high, no attempt was made to re-size the line and reduce the throughput. If the throughput were reduced without re-sizing the line, unit costs would increase some $0.60 per barrel. Even with re-sizing the line, unit costs would increase somewhat over those shown.
(10) Foothills estimate of Trans Mountain's capital costs of constructing 179 miles of pipeline from Low Point to Canadian border and constructing 573 miles of 30-inch loop in Canada, plus present rate base. Does not include possibly required breakwater estimated at $400 million.
(11) Estimate based on Foothills capital cost estimate and using cost of service methodology similar to that used for Foothills project.
(12) Estimated IPPL 10-year average tariff from Edmonton to Chicago for the 10 years following 1982, discounted to 1978 dollars.
(13) Pipeline tariff from Gulf Coast to Chicago via Cushing.
(14) Estimated tanker rate per barrel from Valdez to Gulf Coast.

TABLE 2
ALTERNATIVE TRANSPORTATION SYSTEMS: WEST COAST TO CHICAGO

COMPARATIVE CAPITAL COSTS & TRANSPORTATION COSTS TO CHICAGO
(TEN-YEAR AVERAGE, ESCALATED U.S. DOLLARS)

| Project | Pipeline Mileage | Pipeline Diameter | Throughput | Project Capital Costs | Cost of Transportation $/bbl.<br>New Project | Alyeska | Other Existing Pipelines | Shipping | Total |
|---|---|---|---|---|---|---|---|---|---|
| Foothills: | | | | | | | | | |
| Skagway Alternative | 710 | 34" | 500Mbbls/d | $1,113MM | 1.44(1) | 6.16(2) | 1.06(3) | 0.61(4) | 9.27 |
| Delta Junction Alternative: | | | | | | | | | |
| a) w/full Alyeska Tariff | 1119 | 34" | 500Mbbls/d | 1,676MM | 2.15(1) | 6.16 | 1.06 | 0 | 9.37 |
| b) w/reduced Alyeska Tariff | 1119 | 34" | 500Mbbls/d | 1,676MM | 2.15(1) | 3.66(5) | 1.06 | 0 | 6.87 |
| Trans Mountain: Low Pt. Alternative (Foothills estimate) | | 36" + 30" Loop | 500Mbbls/d | 1,007(6) | 1.39(7) | 6.16 | 0.58(8) | 1.15(11) | 9.28 |
| Northern Tier - Foothills Re-Estimate | 1576 | 40"&42" | 700Mbbls/d | 2,459MM | 2.16(9) to 2.76 | 6.16 | 0.21(10) | 1.15(11) | 9.68 to 10.28 |
| Panama Canal | - | - | - | - | - | 6.16 | 0.76(12) | 5.64(13) | 12.56 |

(1) Foothills tariff based on 75/25 debt equity ration, 16% return on equity, 25 yr.facility life, normalized income tax.
(2) Alyeska tariff from Prudhoe Bay to Valdez. Constant tariff used for lack of a better 10 yr. ave. escalated number.
(3) Foothills estimate of tariff from Keg River, Alberta to Edmonton, Alberta plus IPPL 10-yr. average tariff from Edmonton to Chicago, Illinois for the 10 yrs following 1982.
(4) Estimated tanker rate per barrel from Valdez to Skagway 10 yr. ave. escalated.
(5) If Alyeska charges could be reduced to only those applying to the line segment from Prudhoe Bay to Delta Junction, a savings of some $2.50 per barrel would result, making the applicable Alyeska tariff equal to $3.66 ($6.16 minus $2.50).
(6) Foothills estimate of Trans Mountain's Capital cost of constructing 179 miles of Pipeline from Low Point to Canadian Border and constructing 573 miles of 30" loop in Canada, plus present rate base. Does not include possible required breakwater estimated at $400 million.
(7) Estimate based on Foothills capital cost estimate and using cost of service methodology similar to that used for Foothills Project.
(8) Estimate of IPPL 10 year average tariff from Edmonton to Chicago for the 10 years following 1982.
(9) Foothills estimate based on capital cost re-estimate done internally, and using cost of services methodology similar to that used for Foothills project. Even though the throughput volumes used by Northern Tier are considered to be too high, no attempt was made to re-size the line and reduce the throughput. If the throughput were reduced without re-sizing the line, unit costs would increase some $0.60 per barrel. Even with re-sizing the line, unit costs would increase somewhat over those shown.
(10) Foothills estimate of tariff from Clearbrook, Minnesota to Chicago, Illinois 10 year average escalated.
(11) Estimated tanker rate per barrel from Valdez to Port Angeles, Washington, escalated.
(12) Pipeline tariff from Gulf Coast to Chicago via Cushing escalated at 6% per year.
(13) Estimated tanker rate per barrel from Valdez to Gulf Coast, escalated at 6% per year.

TABLE 3

COMPARISON OF ESTIMATED PROJECT COSTS

| Project | Location | Diameter (Inches) | Length (Miles) | Total Cost ($000) | Cost per Diameter Inch Per Mile ($000) | Cost Per Mile ($000) | Remarks |
|---|---|---|---|---|---|---|---|
| Northern Tier Filed Total Cost | Northern US | 40 & 42 | 1,576 | 1,147,131 | 18 | 728 | This estimated cost includes the tanker off-load facilities, marine pipeline and tank farm(1). |
| Filed Pipeline Cost Only | | | | 1,021,305 | 16 | 648 | Less marine pipeline, tanker off-load facilities and tank farm. |
| Northern Border Gas Pipeline | Northern US | 42 | 809 | 1,074,118 | 32 | 1,328 | Estimated cost(1). |
| Alaska Highway Gas Pipeline | | | | | | | |
| Foothills (Alta.) Portion | Alberta | 48 | 237 | 268,400 | 27 | 1,134 | Estimated cost(2). |
| Foothills (Sask.) Portion | Saskatchewan | 48 | 160 | 237,248 | 31(3) | 1,483 | Estimated cost(2). |
| Northern Tier (Foothills Re-estimate | " | " | " | 1,673,780 | 26 | 1,062 | Total project cost estimated by Foothills(1) |

1. 1978 $US
2. 1978 $CAN
3. Higher than average cost due to large compression requirement.

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1/ Neither the Federal Register notice of our Title V application published on February 6, 1979 (44 Fed.Reg. 7237), nor the series of public hearings recently convened by DOI, is sufficient to overcome this problem. The notice does not indicate when, if or how comments on our proposal should be filed. In any event, since the notice does not include any substantive information about our project, it provides nothing as to which interested parties could direct comments. This latter defect applies as well to the public hearings. How could anybody effectively comment at a public hearing on a project as to which he has no information?

In this regard, it must be emphasized that the notice issued by the Bureau of Land Management on February 1, 1979, and published in the Federal Register of February 6, 1979 (44 Fed.Reg. 7237), is fundamentally incorrect in stating that the application filed by Northwest and Foothills under Title V is "discussed in the draft ES issued January 11, 1979". By its own admission (Vol. I-59), the DES was written prior to November 10, 1978, whereas the application of Northwest and Foothills was not filed until December 8, 1978.

2/ Director's Findings of Fact, Conclusions and Decision, Docket No. EA-79-001-AK (January 10, 1979).

3/ The $1.674 billion figure does not include an estimate of the cost of the terminal facilities nor does it include a provision for Allowance for Funds Used During Construction (AFUDC). When these two components are included, the capital cost estimate for Northern Tier increases to approximately $1.898 billion as shown in the table on page 13 of Part III of these comments.

4/ See Table 1 (10 year average, 1978 U.S. dollars).

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## III

## CRITIQUE OF NORTHERN TIER DES*

### SUMMARY VOLUME

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Page 22 Canadian waters and shores will be affected by marine oil spills and Canadian airspace will be affected by air emissions. There is no indication of the negotiation of agreements with Canada concerning these matters.

Page 40 Table 6
Air pollution would have some effect on Olympic National Park. There is an indication of destruction of winter habitat of bald eagles on Green Point site.

Pages 58-59 and Table 8 The description of the Alaska Highway Oil Pipeline Project, as proposed must be rewritten to conform with the application, as described in Part II of these comments. In addition, the proposal of Northwest and Foothills must be denominated and treated as an application, rather than as an "alternative" to the NTPC proposal.

The comparisons of construction costs in Table 8 (pp. 58-59) are grossly inaccurate. As indicated by Tables 1-3, supra, Foothills estimates that Northern Tier's capital costs will be $1.674 billion (exclusive of terminal costs and AFUDC) compared to $920 million for the Foothills Skagway proposal and $1.376 billion for the Delta Junction alternative. (10-year average, 1978 dollars).

The estimated transportation charges in Table 8 are also inaccurate. To begin with, it is misleading to compare the costs only from the ports of the competing projects to Chicago; such a comparison serves to penalize those projects which are closer to Valdez and thereby have lower tanker shipping charges. When a proper comparison is made of the total distance from Prudhoe Bay to Chicago, Foothills estimates that Northern Tier's transportation cost per barrel would be $8.59 to $9.19, compared to $8.28 for the Foothills Skagway proposal and $5.94 to $8.44 for the Delta Junction alternative.

Under the heading of "Present Status," the DES notes (pg. 69) notes that the Canadian NEB has recommended against a west coast Canadian port. While perhaps relevant to the Kitimat project, this observation has no bearing on the Alaska Highway Oil Pipeline Project which proposes a United States port at Skagway.

④

Page 1-10 There appears to be no provision for diesel fuel storage on site to power the back-up generators and fire pumps. It is imperative that this storage be included and the tank should be of sufficient size to fuel all diesel engines at maximum fuel consumption for one day.

Provision for ships to take on diesel fuel as well as bunker fuel would have to be made at berth, including a separate loading apparatus.

CONT

### Submarine Pipeline

⑤

Page 1-11 With detection of submarine pipeline leaks being at the 0.5 percent drop in pipeline capacity level, 360 barrels of oil could escape before the leak is

Page 1-11 detected. Provision has to be made for simultaneous containment of a submarine pipeline leak and also berth oil spill cleanup. Additional cleanup capacity must be available to contain a submarine pipeline rupture which could release over 71,000 barrels into Port Angeles harbor.

⑥

Page 1-11 The submarine pipelines routed across Port Angeles harbor from Ediz Hook to Green Point are to be "buried beneath the harbor bottom at sufficient depth to minimize the possibility of ships' anchor damage." Despite the precautions outlined in the subsection entitled "Submarine Pipelines," this system has the potential for an oil spill. A key factor here is whether sufficient studies have been made to confirm that the harbor bottom is composed of sedimentary material and will accept a buried pipeline. Foothills does not presently contemplate that submarine pipelines will be installed in the Skagway harbor.

Page 1-11 Weak bottom sediments and near-shore deposits are liquefiable and located in a Zone 3 seismic risk area (modified Mercali VIII). (See page 5, Map Addendum).

In the design of pile structures for near-shore facilities, liquefication potential must be considered. The potential for submarine landslides should be assessed.

Pipe burial in the harbor is essential and will be difficult. Additional studies are required to determine whether trench would silt in naturally or whether material would have to be placed over the pipe.

Page 1-11 Tidal currents are weak in this area and backfill will likely be required. This is time-consuming and costly.

⑦

Page 1-14 The diking plan for the tank farm considers only a six-foot high dike on three sides of the tank farm and a holding basin on the open side with 668,000 barrel capacity. The tank farm is generally sloped at one degree towards the holding basin. This would allow the entire tank farm to be contaminated by tank rupture, especially if it was a tank farthest away from the holding basin, and the possibility of fire spreading throughout the tank farm by burning oil flowing towards the holding basin. Each pair of tanks should be contained within their own dikes which would be of suitable capacity to prevent a major oil spill from spreading beyond those dikes.

Page 1-15 Support Facilities

For power outages of the local utility, the pipeline and pump station will be shut down. As these outages could be serious, e.g., icing of power lines, the pipeline could be out of service for an extended period of time. Present plans call for Foothills to generate its own power on site, but admittedly we do state that we will use commercial power if dependable and available.

Page 1-23 Pipeline System

Northern Tier's Environmental Impact Statement points out the hazards involved with joint use of the present high-voltage alternating current transmission line right-of-way. The AHOP project will not be subject to such hazards.

Page 1-31 Pump Stations
With regard to a leak detection system, deviations as small as 0.5 percent of the pipeline throughput are to be detected by pressure alarms. This will be difficult with numerous crude oils of different flowing characteristics flowing in the system at different pressures.

CONT

Page 1-35 In the construction section, there is no mention of the requirement for communications systems for construction. There will be considerable impact on the public telephone and mobile radio facilities during construction along some portions of the route; this has not been addressed.

⑧

Page 1-35 and 1-38 Scheduling
The scheduling of the project is far too optimistic, regardless of the start date decided upon. No lead time has been allowed for proper geotechnical investigations, and only two months lead time was allowed between material procurement and construction.

The published schedule is also very tight and will likely result in delays for the project. The following chart indicates each of the items which could have lead times long enough to significantly affect the overall project schedule. The "dates required on site" are estimated from the schedule produced by Northern Tier.

| ITEM | Latest Date Required on Site | Estimated Manufacturers Lead Times | Latest Date of Contract Award |
|---|---|---|---|
| A. Marine Terminal Facilities | | | |
| Loading/Unloading Arms | May 1981 | 24 months | May 1979 |
| Meters | Mar 1981 | [illegible] months | Dec 1979 |
| Piles | Dec 1979 | 4 months | Aug 1979 |

Other items with possibly significant lead times are electrical motors, relief valves, and tanks and their associated systems.

| ITEM | Latest Date Required on Site | Estimated Manufacturers Lead Times | Latest Date of Contract Award |
|---|---|---|---|
| B. Pipeline | | | |
| Mainline Pipe (1560 miles, mainly 40 x 0.344 and 42 x 0.375 inches) | Feb 1980 | 3 months | Nov 1979 |
| River Crossings and Casing pipe (14 miles, up to 1.0 inch w.t.) | Feb 1980 | 3 months | Nov 1979 |
| 180 Block and 50 Check Valves | Mar 1980 | 4 months | Nov 1979 |
| Fittings | Mar 1980 | 4 months | Nov 1979 |
| Pumps (20, ranging up to 15,000 h.p.) | Nov 1980 | 12 months | Nov 1979 |
| Construction Contracts | Feb 1980 | 4 months | Nov 1979 |

The above table shows that several of the items required for the marine terminal will need to be ordered prior to their anticipated date of regulatory approval in November 1979, and in fact Northern Tier should be close to ordering loading/unloading arms now.

For the pipeline itself, Northern Tier can probably meet its schedule by placing orders in November 1979. This means that Northern Tier will need to have vendors selected and provisional contracts negotiated by that date. The duration of this preparatory work will vary according to how it intends to go about this process but assuming that it will seek competitive bids, Northern Tier would follow roughly the following schedule:

| | |
|---|---|
| May 1979 | Finalize engineering specifications, commercial specifications, etc. |
| June 1979 | Issue Request to Bid |
| August 1979 | Receive Bids |
| October 1979 | Provisional Awards |
| November 1979 | Sign contracts and first release orders |

For mainline pipe, Northern Tier will require all pipe to be on site by May 1981, with a first order placed in November 1979. This represents some 1600 miles produced in a period of about 16 months.

CONT

If all this pipe were awarded to U.S. Steel, this would represent a load of 100 miles/month out of a total capacity of 130 miles/month (based on 5 day/week production) for their two mills at Baytown and McKeesport (i.e. represents 77% of thier capacity). Kaiser and Bethlehem are, however, also able to manufacture this pipe.

In order to obtain the number of valves required, Northern Tier would need to split the order between several suppliers. Assuming that Northern Tier will select fabricated valves rather than cast valves, there should be no problem in doing this. It is obvious, therefore, that Northern Tier will have to commit to ordering some items for the marine terminal prior to receiving regulatory approval if it is to maintain the published schedule. As long as all preparatory work is completed beforehand, Northern Tier can probably wait until it has received approval before committing to any items for the pipelines and pump stations. Northern Tier will then be on a very tight time frame to keep to the schedule, however.

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_/ This critique will highlight the major inaccuracies in the DES. It should not be construed, however, as a complete list of Foothills' objections to the NTPC project.

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CONT

Page 1-48 Operation and Maintenance

Northern Tier plans to contract out major repairs and all but routine maintenance. This would indicate a lack of confidence in their own ability to carry out this very important work. There is no substitute for a compentent company maintenance work force, and Foothills, with strong support from its experienced operating parent companies, Alberta Gas Trunk Line and Westcoast Transmission Company, will employ and train such a maintenance crew. In the event of a line break and oil spill, Northern Tier would have no assurance that contract help would be immediately available to effect repairs and clean up the spill.

Page 1-49 No mention is made of pilots to berth the ships. It is assumed that pilots would be necessary to bring the tankers to berth.

The unloading sequence must be changed to allow the unloading supervision at the berth to have the final action in commencing the oil discharge.

9 Page 1-51 Based on the costs presented, there seems to be no provision in the design to prevent massive spills in the event of earthquakes. Port Angeles is in a Zone 3 (major damage) seismic area, with a very active history of earthquakes, including several of major proportions. With the cost levels indicated in Table 1.4-23, it appears that the design is based on the tank farm and berth being constructed in a Zone 1 area. The costs of constructing a facility to withstand the magnitude of earthquake that could occur would be about double their estimate.

The cost of the 10,000 HP electric booster pumps is grossly underestimated.

Construction costs have been re-estimated by Foothills and were found to be significantly low. Re-estimates are detailed below.

There seems to be an error in Tables 1.4-22 and 1.4-23. In Table 1.4-23, the total shown as 1,152,131 should be 1,147,131, the total shown as 1,194,002 should be 1,174,002, and the total shown as 69,622 should be 64,622. In Table 1.4-23, the total shown as 77,625 should be 77,595.

Page 1-51 Table 1.4-22

The estimates in this table do not include a provision for Allowance for Funds Used During Construction (AFUDC). Based on the revisions mentioned above and including AFUDC at the rate of 12.8%, the capital cost has been re-estimated by Foothills as $1897.5 million, and appropriate revisions to Table 1.4-22 are given on the next page:

Table 1.4-22: Summary Cost of the Northern Tier Pipeline System (Thousands of dollars, May 1978 price levels)

| | Initial Phase (709,000 bpd) | |
|---|---|---|
| Construction Cost | Filed Cost | Re-estimated Cost |
| Tanker unloading facilities | 44,804 | 51,810 |
| Submarine pipelines | 28,021 | 35,250 |
| Onshore storage facilities | 52,941 | 53,840 |
| Pipeline system - Port Angeles to Clearbrook | 1,021,565 | 1,541,304 |
| Error in arithmetic | 5,000 | - |
| Sub-total before AFUDC | 1,152,131 | 1,682,204 |
| AFUDC @ 12.8%(1) | - | 214,322 |
| | 1,152,131 | 1,897,526 |

CONT

9 (1) Based on debt: equity ration of 75:25 and 11% interest rate on long term debt and 18% return on equity.

Page 1-53 Tariff Estimates

The Department of Energy developed tariff estimates by applying the Interstate Commerce Commission method, which is based on return on the valuation (reproduction cost of plant less depreciation.) In Canada, tariffs are generally based on book value of the plant and cost of service principle.

10 Table 1.4-27

This table is based on an earlier capital cost estimate done in 1977 base dollars which amounted to $949.1 million. The revised capital cost estimate done by Foothills and its consultants is $1897.5 million. Applying the ratio of the revised capital cost estimate in the earlier estimate after converting it to 1978 dollars, the re-estimated tariffs are 1.87 times those given in Table 1.4-27. A revised tariff table follows.

Table 1.4-27: Tariff Estimates - Re-Estimate(1)
(May 1978 price levels)

| Delivery Points \ Tariff Dollars Per Barrel | 8 Percent Return 709 M bpd | 8 Percent Return 933 M bpd | 12 Percent Return 709 M bpd | 12 Percent Return 933 M bpd |
|---|---|---|---|---|
| Port Angeles, Washington to: | | | | |
| Glacier Pipeline (Harlowtown, Minnesota) | 0.996 | 0.862 | 1.383 | 1.140 |
| Western Crude Pipeline (Richey, Montana) | 1.308 | 1.082 | 1.751 | 1.434 |
| Amoco Pipeline (Tioga, North Dakota) | 1.436 | 1.183 | 1.923 | 1.566 |
| Clearbrook, Minnesota | 1.895 | 1.547 | 2.536 | 2.049 |

(1) Re-estimate is based on using the ratio of the revised capital cost of $1897.5 millions to the original 1977 base capital cost of $949.1 million after converting it to 1978 dollars using 7% escalation rate (1897.5/(949.1 x 1.07) = 1.87).

Page 1-55 A necessary part of the Spill Contingency Plan must be public education about the plan, as well as public input into its development. Public relations personnel are referred to, but their roles and responsibilities are not explained.

11 Page 1-56 According to the Draft Environmental Statement, in the event of an oil spill along the route, public protection could involve relocating exposed residents to temporary housing, blocking roads, and keeping spectators away from the site. These procedures, particularly relocation, will obviously cause social impact, yet no mitigative or compensatory measures are discussed. The availability of temporary housing is assumed, but no explanation is given of the distance residents may have to travel, or the duration of their relocation.

Page 1-58 Measure #25

Northern Tier anticipates that the fiscal impact of construction will be partially or fully mitigated by this measure. Consideration is not given, however, to the question of lead times required for appropriate impact management planning.

Page 1-58 Measure #26

The effectiveness of measures #25 and 26 are dependent upon the availability of adequate lead time for appropriate impact management planning. Elsewhere in the report (page 8-116), Northern Tier estimates completion of the project 22 months after approvals by Federal, State, and local governments are received. Construction of the pipeline would require 8 - 12

CONT

11 Page 1-58 months, and of the port and onshore storage facility, 18-20 months (page 1-41). For Port Angeles, this means a maximum of four months to apply for and obtain fiscal compensation. Within the same period of time, Northern Tier must assess local labor, determine the potential for in-migration, and establish the availability of housing for in-migrants. Along the remainder of the route, longer lead time for planning is available, but the large number of communities (89) to be dealt with within this period must be recognized. Time constraints will significantly reduce the effectiveness of measures #25 and 26.

Page 1-58 Rip-rap will not be used at river crossings. This implies that all river panels are stable; such is not the case.

12 Page 1-62 Reference to the Foothills pipeline proposal is outdated.

13 Page 1-63 The List of Acts related to Legal Constraints does not include the Federal law regarding the crossing of Indian lands, which is mentioned on page 3-125. Legal implications of the denial of a permit by the acting energy director of the State of Minnesota, John Millhone, is not discussed.

CHAPTER 2

14 Page 2-10 Seismic Risk

Seismicity and seismic-related hazards have purposely been de-emphasized, although Page 5 of the Map Addendum clearly indicates that nearly 600 miles of the pipeline will be affected. All facilities (especially the marine pipeline) at Port Angeles, as well as pipeline and other facilities located in the Puget Trough, the Cascade Mountains and the Rocky Mountains, will be vulnerable to seismic problems.

15 Page 2-11 Table 2.1.1.4-2

The table which gives the Modified Mercali Intensity Scale is in error (i.e., the description of Intensity VIII, which is the intensity assigned to Port Angeles, was mixed up with Intensity I of the table).

16 Page 2-12 Slope Stability

The bluff at Green Point has been identified as unstable and prone to erosion, yet no remedial designs have been mentioned or alluded to.

17 Page 2-50 Pipeline

The following is a brief assessment of major geotechnical and/or hydrological considerations which would apply to each of the major topographic provinces traversed by the pipeline:

Pacific Border Province - Fast flowing streams and steep sided gullies require detailed stability and river crossing design assessment.

Sierra Cascade Province - Mountainous terrain, fast flowing streams and steep slopes will require detailed stability and river crossing design assessment.

Columbia Plateau Province - Lateral migration of streams and erosion are major concerns.

Northern Rocky Mountain Province - Mountainous terrain with steep slopes and numerous fast flowing streams will require detailed stability and river crossing design assessment. Constructibility in steep mountainous terrain is also a major consideration.

Great Plains Province - Rolling terrain with numerous streams. Lateral migration of stream crossings must be assessed.

Central Lowlands - Glacial debris and lacustrine deposits at low-lying areas will require extensive buoyancy control measures. In addition, river banks in lacustrine deposits are prone to instability. Soil chemistry is highly corrosive to buried steel pipe. Subsidence due to lowering of water table and ditching

CONT

17 through areas of swelling clays (clays which swell when in the presence of water) such as Montana are not considered major problems to pipeline integrity. These phenomona must be considered in the design of facilities such as pump stations.

Page 2-103 The same observation is made here as on Page 2-27, that is, "The areas of potential impact have not been systematically investigated with the objective of identifying cultural resource sites." (The Foothills oil line proposal does not have this deficit to the same extent, since the Alaska Highway gas pipeline route has undergone archaeological and historical site studies.)

Pages 2-118 A total of 89 cities, towns and rural centers across to five states are listed as being within the pipeline corridor, in contrast to the comparatively sparsely populated regions in Alaska, the Yukon Territory, British Columbia and Alberta traversed by the AHOP project.

18 Pages 2-140 2-145 Municipal services, other than fire and police to to protection, are not listed. School facilities are not discussed, nor are the economic activities of the counties.

19 Page 2-152 In the document, it is assumed schools along the pipeline route would not be significantly impacted since construction crews would not be accompanied by children. No comment is made on potential impact during the operations and maintenance phase.

20 Although figures are given showing the numbers of beds available in hospitals along the route, average vacancy rates are not given. The adequacy of available medical facilities cannot, therefore, be assessed.

21 Page 2-153 The observation is made that "Police protection is generally considered to be adequate for present conditions." This, however, does not necessarily indicate that protection would be sufficient for a rapid influx of workers.

CHAPTER 3

Page 3-2 Olympic National Park is affected by the existing visibility-reducing emissions, and would be impacted by the increase of $SO_2$ and $NO_x$. There will also be close restrictions placed upon the sulphur content of ship's bunker and other fuels at Skagway.

In general, the three critical differences between the Northern Tier and Foothills proposals are:

1. Impact on international waters and coasts;
2. Importance of aquatic and coastal ecosystems to local peoples (Vancouver and Seattle versus Skagway); and
3. Greater productivity in Puget Sound.

It is extremely doubtful if any air quality standards will be exceeded at Skagway for any significant proportion of the time.

22 Page 3-3 Tankers would probably use diesel fuel for operating while in port, and this factor is not included in the discussions of air quality.

Page 3-4 The Northern Tier system capacity appears too high in terms of tanker traffic for the capacity of the airshed to disperse contaminants. This is not likely to be true of the AHOP terminal and facilities at Skagway.

23 The document states that "The Northern Tier Pipeline Company proposal has generated little controversy outside the Port Angeles area." No mention is made of the decision of the State of Minnesota's acting energy director to deny a permit to build the portion of the line in northern Minnesota. Nor is there reference to a previous statement (Page 2-150) that "At this writing, it is the official position of the tribes (Confederated Salish and Kootenai Tribes of the Flathead Reservation) that the Northern Tier Pipeline shall not cross the reservation."

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Page 3-5 The Northern Tier logic of not using the worst emission scenario seems questionable. It is doubtful if such juggling of methods would be required in order to present an acceptable air quality picture at Skagway.

Page 3-6 Extensive hydrocarbon emissions will probably occur at Port Angeles and thus the ozone problem may be exacerbated to the point where "offsets" would have to be obtained from local industry by the Proponent, thus significantly increasing the costs of the project. No such circumstance is envisaged at Skagway.

Page 3-7 Smoke plumes or haze lying about the general Port Angeles area would not be conducive to enjoyment of Olympic National Park. No such degradation will occur near Klondike International Park.

㉔ Page 3-9 No consideration is given to the level of noise which will be created by trucks servicing Ediz Hook. On Page 2-32, it is stated that the only road access to Ediz Hook is via Marine Drive and the city streets of Port Angeles. This means that the volume of trucks expected will be passing through Port Angeles and this will no doubt cause significant noise increase along the truck routes.

Pages 3-10 to 3-12 Topography/Geology

The Puget Sound aquatic system is far more productive than Skagway, and thus the effects of a seismic caused spill could be more devastating.

Page 3-11 Seismicity

The low probability of a large magnitude earthquake and an associated spill must be weighed against the high risks of such an event in the biologically productive aquatic environment and socially important environment of Puget Sound.

㉕ Page 3-12 Slope Instability

Only limited geologic studies have been undertaken in relation to submarine slides on the relatively steep shelf. The risk of drilling or seismic activity initiating failure is not fully or adequately explored.

㉖ Page 3-12 The paragraph on ground shaking totally understates the possible effects of an earthquake. Port Angeles is classed as a Zone 3 area, where major damage can and has occurred. The designs of the berths, pipeline and tank farm do not seem to include provisions to enable these facilities to withstand the earthquakes that could occur. Therefore, the construction costs and the potential costs of the environmental impacts are understated.

㉗ Page 3-17 The Tank Farm Risk Analysis is stated to be determined from historical data of tank farm spills. Unless this data was viewed in light of the earthquake potential, it is understated, because most tank farms will not have the same exposure to seismic activity.

Pages 3-25 to 3-32 An in-transit oil spill in the approaches to Port Angeles will impact very productive fisheries, clam beds and both waterfowl and mammal habitats. At-berth oil spills are "expected to be small but frequent" and this could affect both edible marine resources and water quality. Although similar events could be expected to produce impacts in the marine approaches to Skagway, marine resources, especially near the port itself, are much less abundant.

Page 3-33 A similar situation exists in the Port Angeles area for offshore feeding birds in kelp beds and open water, and for brant and ducks in eelgrass beds. Severe mechanical and toxic impacts upon large numbers of these birds would be occasioned by an oil spill. With the possible exception of the Katzehin Delta, no such productive avian habitat is found in the near approaches to Skagway.

Page 3-35 Concerns regarding eagle roosting areas on Green Point are included in comments on the Summary Volume.

CONT

Page 3-36 There appears to be no adequate plan for archaeological/palaeontological salvage or for on-site monitoring during construction at Port Angeles. Plans and policies are already being formulated by Northwest and Foothills for the Skagway and White Pass area.

Pages 3-37 and 3-38 Visual Resources

The very drastic cliff cut at Green Point would present a damaging visual scar all during operations and would not be improved by the act of abandonment. No such interference with local topography is planned at Skagway.

Pages 3-39 and 3-40 Land Use

At Port Angeles, the existing small boat facilities would be displaced and the local users would be subjected to much in the way of congestion and "nuisance impacts" during the 18 months or more of the construction period. The area would lose much of its desirability for other industrial port users. Such displaced land uses are not very likely to return following abandonment of the system. At Skagway, by contrast, the integrity of the small boat harbor will be respected, while the normal functioning of the port will be maintained during construction of the terminal facility.

In the Port Angeles area, the existing log storage uses would be forced to relocate inland at enormous inconvenience, since there are no alternative harbor sites. No such displacements are anticipated in the Skagway area.

Page 3-39 and 3-40 The Northern Tier project would run counter to the County master plan which contains regulations forbidding the disturbance of the cliff at Green Point. The City land use recommendations for improved recreation on Ediz Hook would also be contravened. Extremely little of this type of disturbance is anticipated at Skagway.

Page 3-47 Recreation Resources

At Port Angeles, boating, mooring and land-based recreation will be affected on Ediz Hook during construction, while the latter two would also be affected during operations. The occurrence of a spill would greatly intensify the impact on recreational facilities. With a 200-boat waiting list, current moorage is inadequate. The establishment of tanker docking facilities would eliminate many of the existing mooring areas. Salmon fishing, a major tourist attraction, would be significantly affected. None of the above disturbances would be incurred to any significant degree at Skagway.

㉘ Page 3-47 "Curtailment of use of the Port Angeles-Victoria auto ferry would affect an indeterminate number of recreationists, particularly if a major oil spill occurred in the harbor during the peak summer use season." This observation is made, but is not included under "Canadian Areas of Interest" (page 3-49), though recreationists bound to or from Canada would be equally affected.

Page 3-48 At Port Angeles, the intensity of traffic in small pleasure craft gives rise to great apprehension among boaters concerning collisions between small craft and tankers, while at Skagway the much lower density of small boat traffic will go far to allay such fears.

㉙ Page 3-49 Social and Economic Conditions, Population

It is stated that "the population of Clallum County would be temporarily increased beginning 4-6 weeks in advance of and extending through the initial construction period. Prior to the initiation of construction the additional population would consist of less than 50 advance construction personnel."

This does not include consideration of speculative job-seekers entering the county following the permitting of the project and prior to construction. Nor is the impact of speculative immigrants considered for

CONT ㉙ the remainder of the construction period, except for a statement on page 3-30 ("Industry and Employment") indicating the unlikelihood that many job seekers would stay without employment. This experience should be compared to the experience of Alaska during the Alyeska project. Although the Northern Tier project may not acquire the same "high profile" that Alyeska did, and therefore may not draw as many speculative in-migrants, Port Angeles is more readily accessible to speculative job seekers in the lower 48 states than Alaska was or is.

㉚ Page 3-50 It is stated that "since reduction in tourists business would be more than offset by increased business from construction-related activities for most businesses, the economic impact is not considered significant." However, earlier in the document (page 2-42), a survey is cited in which hotel and motel operators indicated "that they would be reluctant to house construction crews on a semi-permanent basis during a local construction project. The attitude is apparently directed at preserving openings for tourists who might bring repeat business." The short term "boom" for local businesses due to construction may not offset the potentially long term economic impacts related to decreases in tourist business. Nor is the potential "bust" phenomenon following construction completion discussed. If local businesses are encouraged to expand beyond long term needs to meet construction-related demands, over-capitalization may create hardships for these local businesses.

The question of potential competition for labor between the project and local businesses, with the possible impacts of high labor turnover and declines in local levels of service, is not addressed.

㉛ Page 3-53 It is stated that the 85-bed hospital in Port Angeles has an occupancy rate of 75.7% (1975 data), and that the project-related population would probably not significantly impact this facility. The potential impact on medical services may be under-estimated. Dixon (Dixon, M. 1978, What Happened to Fairbanks: The Effects of the TransAlaska Oil Pipeline on the Community of Fairbanks, Alaska, Westview Press, Boulder, Colorado) indicates that an occupancy rate of 80% represents a maximum for efficient hospital operation. An increase in occupancy of only four beds would exceed this maximum efficiency level.

㉜ In the mention of impacts on police services during the operation phase, discussion is limited to potential impacts during a major disaster. No consideration is given to the possible impacts on police services resulting from the social disruption and deterioration of social cohesion outlined under impacts on social conditions (page 3-54).

㉝ Page 3-54 Within impacts on community services, it is assumed that demand for counselling services of several kinds would increase only in proportion to increases in county population. However, counselling services might be expected to face additional increased demand as residents attempt to cope with the significant disruptions to social conditions discussed in pages 3-54 and 3-55.

Possible impacts on community services during the "bust" period following construction are not discussed, nor are the potential impacts related to disruption of normal economic activities (tourism, fishing, boating) during construction, operation and abandonment phases.

㉞ Page 3-55 In the brief comment on impacts on medical services during the operation phase, potential overburden of facilities is mentioned only in relation to a major fire or explosion. Later in the report (page 3-55), reference is made to impacts to human health from eating contaminated seafood, but this has not been considered in relation to impacts on medical services.

Pages 3-56 and 3-57 Air Quality

Householders of 34 U.S. communities along the proposed route would have a high expectation of dusty conditions. As construction activities moved along, 7700 to 11,000 pounds per day of fugitive dust would be emitted

CONT to the local atmosphere. By contrast, very few residences will be subjected to the dust of construction along the 14 miles of pipeline route between Skagway and the Canadian boundary.

Pages 3-58 and 3-59 Noise

By the same token, each of the 34 U.S. communities could expect up to four days of construction activities, producing noise levels between 57 and 65 dBA during the daytime; again, for the AHOP project, extremely few U.S. residences will be subjected to construction noise.

Page 3-60 At least three faults are shown to be active, yet no mitigative measures have been suggested.

Page 3-61 Outburst flooding dangers for the Northern Tier Project (scour, erosion, inundation of pump stations) would constitute a very significant hazard situation along approximately half the length of the route. By contrast, this type of event for the Alaska portion of the AHOP route would carry a very low probability.

㉟ Page 3-61 Scour

Method of scour calculation is not discussed nor are the depths of burial required for major crossings analyzed.

㊱ Page 3-62 [illegible]

The cost of abandonment in more populated areas is considerably higher than in more remote areas, as sites in populated areas will have to be restored to a higher standard. Extensive amounts of borrow material will be required to backfill all trenches, i.e., 1700 to 1900 cubic yards per mile of pipe. The impact of this large borrow material requirement has been omitted in the Draft Environmental Statement.

㊲ Page 3-62 Soils

Terrestrial impact of an oil spill or the accumulative effect of numerous small, difficult-to-detect oil spills on prime agricultural land is not discussed adequately, especially methods of reclamation.

Page 3-62 The Northern Tier route would probably interfere with some coal deposits along the way, whereas there are no known mineral deposits along the Alaskan portion of the AHOP route.

Page 3-64 For the Northern Tier project, there would be problems of soil compaction by construction over agricultural land, whereas little or no agricultural land will be traversed by the AHOP route.

Pages 3-67 to 3-69 Northern Tier does not appear to be knowledgeable about the safeguards which can be applied to hydrostatic testing of the pipeline, thus the return of testing water to aquatic ecosystems would probably involve the impact of raised pH and temperature and of bacteriocides. Discharge of testing water from the excessive-capacity pipeline system would probably also cause disruption of the bed profiles of the receiving [illegible].

Page 3-70 At the 46 crossings of major U.S. rivers planned by Northern Tier, the excessive capacity of the oil transportation system would yield large values for calculated maximum oil spill sizes. At maximum pipeline throughput, these values range from 0.240 to 14,110 barrels. In comparison, the AHOP system crosses very few streams in U.S. territory, while the more modest capacity of the system will render calculated spill values of a much smaller size.

Pages 3-68 and 3-69 Table 3.26-1

During construction of the Northern Tier pipeline, the estimated increases in sediment load on 27 of the rivers to be crossed would range from zero to 29,000 ppm. Eight of the 12 crossings within the Missouri basin would exhibit increases in sediment loading greater than 10,000 ppm.

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Pages 3-70 to 3-78 Aquatic Biological Components

The increased sediment load would impair production of salmon and trout; young-of-the-year would be most severely affected. Increased sediment would reduce production of aquatic insects and thus would displace feeding fishes. An oil spill into the aquatic systems would most seriously impact upon concentrations of juvenile salmon and searun trout. Populations in lakes and reservoirs would also be affected severely. The possibility of contamination of two fish hatcheries also exists. Of the 22 projected stream crossings in western Washington state, 15 contain significant spawning habitat for both salmon and trout. Of these 15, streambed sedimentation and/or streambank erosion are anticipated to be extensive on five. With respect to seven of the 22 streams, the losses of juvenile salmon and trout from oil spill effects are estimated to be high. In the event of such a spill, up to 20 years might be required for some searun fish populations to recover from the loss of a year-class of progeny. Bank revegetation is expected to be exceedingly difficult at four of the river crossings, in which case bank erosion and sedimentation could continue "for many years." At four other crossings, on the other hand, streambed scouring would be a continuing problem for the entire life of the project.

Page 3-70 to 3-78 With respect to all the described impacts upon aquatic systems, there appears to be, on the part of Northern Tier, neither the required degree of knowledgeability, nor the capacity to take a sufficiently broad and comprehensive approach, nor indeed even the intrinsic willingness to learn and grapple with issues of control and containment of aquatic oil spills or of mitigation of streambank erosion and sedimentation.

By comparison, the Alaskan section of the AHOP route involves relatively manageable crossings, with these being crossings of only a few streams. An upstream spill on the Skagway River, for example, would not impinge on highly productive habitat and, if not immediately contained, would be rapidly dispersed by wind, wave and flushing action in Taiya Inlet. Along the 14 miles of the Alaskan section, mechanical retention of rock walls will be the rule, and problems with soils, erodibility and sedimentation very much the exception. Comprehensive oil spill contingency plans are being formulated.

Pages 3-79 and 3-80 Marine Resources

With regard to the Northern Tier project, a large oil spill into one of the rivers emptying into the Sound would have extremely severe consequences, particularly on the Pacific oyster culture. Neither south Puget Sound nor Hood Canal are subject to rapid flushing, thus an upstream pipeline rupture would create serious and long-lasting degradation of habitat for otter, harbor seal, waterfowl, oysters, other molluscs and crustaceans, as well as for herring spawning and for the fish which feed upon the young herring. Again, by comparison, and as described in the preceding section, an upstream spill on the Alaskan portion of the AHOP route would be quickly dispersed under the normal conditions of Taiya Inlet.

Pages 3-80 to 3-83 Terrestrial Vegetation

Land, to the extent of approximately 91,000 acres, would be cleared and prevented from revegetating during the operational phase of the Northern Tier project. The AHOP system will alienate only about 25% of this amount of land, partly because of its much shorter overall length and partly because almost 60% of the route lies coincident with another pipeline corridor.

There is a distinct possibility that up to eight federally-proposed endangered plant species could occur along the Northern Tier route. In contrast, no endangered plant species are known to occur along the Alaskan segment of the AHOP route.

The Northern Tier Draft Environmental Statement provides no estimate of loss of merchantable timber or of production loss. Due to the nature of the terrain and of the White Pass corridor, impingement of the

CONT

Alaskan segment of the AHOP route upon commercial forest resources will be negligible.

Because of the nature of the terrain to be crossed by the Northern Tier route, there will be "substantial loss of a limited habitat" caused by tree removal within riparian habitat in grasslands. This specialized habitat is not a significant factor in the Alaskan segment of the AHOP route.

Page 3-84 Northern Tier will induce "substantial negative impact from loss of wetlands." Such habitat is not a significant factor in the Alaskan segment of the AHOP route.

Because of the excessive capacity of the proposed Northern Tier oil transportation system, the remote detection system would not be able to sense leakage of less than 4 660 barrels per day, whereas the more modest capacity of the AHOP system will permit a much lower threshold of detection.

Pages 3-84 to 3-92 Terrestrial Wildlife

"Unknown numbers" of wintering eagles would be displaced by the Northern Tier pipeline. Peregrine falcon habitat would probably be abandoned by the birds. Pipeline construction would bring about waterfowl nest abandonment, reduction of breeding habitat and displacement of wintering populations. Two prairie dog towns would be crossed with an attendant reduction of black-footed ferret habitat. According to the Northern Tier schedule, pipeline construction would occur during periods of greatest sensitivity for nesting osprey, wintering deer and elk, bald eagle nesting and sage grouse dancing grounds, and would occur during periods of somewhat lesser sensitivity for nesting waterfowl, pheasants, great blue heron, peregrine falcon, elk calving, bighorn sheep spring range and the strutting grounds of sharp-tailed grouse. Disturbance of wildlife and habitat on such a scale will not be the case for the construction schedule of the AHOP.

㊳ Grizzly bear habitat would be disturbed by Northern Tier pipeline construction; however, it seems optomistic to have suggested in the Draft Environmental Statement that the bears would "abandon" such habitat. No realistic planning appears to have been done in the interests of coping with this problem.

㊴ Pages 3-84 to 3-92 Northern Tier has proposed "limited" chemical control of vegetation on the right-of-way. In addition to the effects mentioned with respect to forests, this application of herbicides will affect all types of land involved, including agricultural and cultivated grazing land, as well as wetlands and waterfowl habitat.

Page 3-93 Total losses of waterfowl production, due to Northern Tier construction activities, could be expected to reach almost 26,000 birds per year. In addition, a particular population of 80 bighorn sheep would probably lose an entire year's lamb production. These are highly significant impacts, the intensity and magnitude of which would in no way be approached by AHOP construction activities along the Alaskan segment.

㊵ In the Northern Tier Draft Environmental Statement, the assertion is made that ". . .wildlife requiring undisturbed habitat could move to areas with less disturbance. . ." This is obviously unsound. The ecological niches are filled in the surrounding areas and competition for food and territory is fierce at any time. Moreover, how much territory remains in the northern tier states which can truly be described as "free from disturbance"?

Page 3-102 The production of as much as 4000 acres of prime farmland will be affected by the NTPC route; it will also disrupt the drainage and serve as a deterrent to the installation of new irrigation and drainage schemes which have been planned. There is no significant amount of agricultural land anywhere along the Foothills route.

CONT

㊶ Page 3-104 The Draft Environmental Statement does not list the land classifications of all the area of the Coeur D'Alene Indian reservation that will be affected by construction. A total of 315 acres will be affected, 35 acres of which are agricultural land and 25 acres of forest and woodlands. Thus, 255 acres are not accounted for. The proposed Foothills oil pipeline route will avoid crossing any Indian reserves. It will also avoid any established or known potential ecological reserves. The Northern Tier proposed pipeline will, in contrast, pass through land being inventoried for possible wilderness protection.

Page 3-112 The proposed Northern Tier route will cause significant loss of visual quality in nine designated scenic/recreation areas, four scenic travelways, and six scenic waterways. Northern Tier oil spills at major river crossings could affect fishing in five rivers, and spills on the coast could affect tourism on the Olympic peninsula. Recreational fishing and tourism in general along the Foothills route is not oriented to single destinations; therefore, tourism activities would not be affected to the same extent.

㊷ Page 3-121 Population pressures due to in-migration of speculative job seekers are not addressed.

㊸ Page 3-124 Impacts on medical facilities, police protection, and community services are discussed generally, with no reference to potential impacts in individual communities. No indication is given of any contact with local service-providers towards identifying impacts.

㊹ Planning for the management and mitigation of impacts will generate demands on the manpower and resources of communities. The capability of communities to meet these demands is not assessed.

㊺ Page 3-125 The Federal law requiring approval by tribal officials to use reservation lands, and the formal policy of the Confederated Salish and Kootenai Tribes against allowing the pipeline to cross the Flathead reservation, may produce a legal constraint not indicated in the listing on page 1-63.

## CHAPTER 4

Page 4-4 Cultural Resources

If it is assumed that the mitigative measures identified in this section would occur following permitting, and given the limited reference to studies completed to date by Northern Tier and its 22-month timeframe for project completion, Northern Tier's ability to adequately locate, identify, and evaluate cultural resources, as well as re-design or relocate the project to avoid such resources, or, where necessary, implement a data recovery program, might be questioned.

Page 4-6 Under point 1 of the subsection on committed mitigating measures, the statement is made that if truck deliveries become objectionable (by increasing congestion), they could be scheduled for non-working hours. This is impractical because deliveries have to be made when a crew is working to receive them and this would cause higher noise levels during night hours which would be objectionable to residents.

## CHAPTER 5

General The Draft Environmental Statement is very detailed in identifying environmental base line data and environmental impacts but is lacking in mitigative-measures needed to minimize the adverse impacts, particularly those affecting the integrity of pipeline facilities.

CONT

The document treats geologic hazards and seismicity as unavoidable adverse impacts.

Following are brief comments regarding those areas regarding geotechnical problems which are most vulnerable to criticism.

Page 5-3 and following pages Table 5.2-4.1 on page 5-4 entitled "Summary of Residual Adverse Impacts" lists the following geologic hazards and seismically related events:

- ground shaking
- surface fault rupture
- liquefaction
- slope instability
- outburst flooding

These are considered unavoidable adverse, or residual impacts with no committed mitigative measures identified.

Other major pipelines, particularly the Alyeska oil pipeline, encountered geologic hazards similar to those listed above. Alyeska designed mitigative measures to minimize the risks associated with a major seismic

Page 5-3 and following pages effect. Examples of mitigative measures which have not been addressed in this document include:

- special fault crossings designed to permit a substantial fault displacement to occur without pipe rupture.

- Liquefaction-prone areas with designs incorporated to minimize threats to pipe integrity. Design approaches such as slope flattening, excavating and replacing with non-liquefiable materials, soil buttresses and burial below liquefiable soils have been used on the Alaskan oil pipeline.

- Slope instability to be avoided as one of the mitigative measures. Analyses which incorporate seismic accelerations should be used, and where slopes are shown to be unstable, mitigative measures must be adopted. Slope flattening, toe berms and drainage control are some of the more widely used stabilization measures.

- Outburst flooding is a hazard which is difficult to predict, but areas which are subject to such outburst flooding can be identified, deeper burial specified and special valving incorporated to minimize adverse effects of a line break.

The proposed marine terminal facilities at Port Angeles will be located in the area most prone to the above referenced geologic hazards. The 6-1/2 mile submarine pipeline and on-shore facilities are prone to adverse impacts related to liquefaction, seismically induced submarine slides and faulting. Considering that these facilities will be located in

Page 5-3 and following pages a major harbor surrounded by an urban area, proper design of mitigative measures to ensure pipeline integrity is essential. We believe that this is the most important area as far as geotechnical matters are concerned where the document is open to criticism.

Page 5-7 Visual Resources - Abandonment

It is not indicated whether all facilities would be removed during abandonment, or whether the post-abandonment site would continue to have visual impact.

㊻ Page 5-11 The potential impacts on local business and industry of increased labor turnover and competition for labor with the project during the construction phase are not discussed.

Interference with tourism and other recreationally-based business activity during construction, operation and abandonment has not been noted.

The impacts of the likely "bust" period following project construction is not referred to.

㊼ Impacts on medical facilities during construction is listed as "none". This is highly questionable.

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CONT

㊼ Strains on police protection due to the indirect effects of project construction on social cohesion and other socio-cultural impacts are not cited.

㊽ Page 5-12 Reference to impacts on community services, due to project-related deterioration of quality of life, social cohesion, polarization of community attitudes and rapid social change, are neglected.

㊾ Page 5-23 Under "Industry and Employment," the ability of construction-related activity to offset the short term and potentially long term impacts on tourism can be questioned.

㊿ Police protection would also be impacted by the potential project-related social disruption and in-migration. Northern Tier has not indicated plans for cooperation between local law enforcement services and project security staff, nor has it indicated policies relevant to minimizing negative worker interaction with communities.

No consideration is indicated of the potential impacts of loss to project jobs of police, firemen, or community service providers.

Longer term impacts on community services of social disruption have not been addressed. Impacts unique to individual communities, or potential mitigative measures on a community-by-community basis, have not been identified.

The impacts on social conditions cannot be assumed to be entirely short term ones.

Page 5-21 Construction Phase

There will be significant impact on public communications facilities along portions of the route.

CHAPTER 6

(51) Page 6-2 The document states that "The trade-off can be seen as a short term commitment to an industrial installation with a sacrifice of a short term commitment to a way of life based on use of local natural resources." Such a statement is questionable. The paragraph leading to this sentence cites the importance of the scenic surroundings, easily available services and friendly atmosphere. Although crowding and labor turnover may only impair the availability of services in the short term, and the friendly atmosphere may well return following the departure of the major influx of project workers, the impacts on visual resources, the potential risks to quality of life and the disruption and adjustments stimulated by project-induced rapid social change cannot be expected to have solely short term implications. Project workers may alter the demographic mix of the community, particularly in the factor of age. Local prices and costs may not drop following completion of construction, as local businesses cover the costs of expansion incurred for project participation. The retired people of the area may be particularly susceptible to the difficulty of adjusting to rapid change, increased industrial activity, and inflated cost-of-living, and to impacts on health and safety, without access to the potential benefits of project employment and increased personal income. In addition, planning for and mitigation of project-related impacts may divert limited manpower and resources from the planning and provision of services directly related to the longer term needs of the local population.

(52) Page 6-3 It is stated that, in the areas affected by the pipeline system, "none of these resource uses (the variety of social services required in route communities during construction) would require significant trade-offs or constrain long term opportunities." This statement indicates a lack of sensitivity to the possible commitment of manpower and resources to services required during project construction, to the possible detriment of planning, development or up-grading of services needed by communities in the longer term. The social services requiring up-grading to meet project-related demands cannot be assumed to be

CONT

(52) the services which require priority commitment for the communities in the present or longer term. There is no indication that discussions have been held with local planners or service providers to identify potential areas of complementarity or conflict.

Page 6-3 It is noted that "The short term needs of electric power for the pump stations may result in insufficient power supply for consumers in western portions of the project area at least through the mid-1980's."

CHAPTER 7

(53) Page 7-5 The discussion of irretrievable commitment of manpower to the project neglects to mention the manpower directly or indirectly required to assess, mitigate or compensate for project impacts. Although much of this manpower would be committed primarily prior to and during project construction, where direct and indirect impacts are potentially long term, manpower commitments to impact mitigation may be required for many years, perhaps exceeding the life of the project. (For example, care and rehabilitation of injured persons, community service provision to offset the effects of loss of social cohesion and deterioration of quality of life, etc.)

Oil spill impacts on the health and safety of individuals would be irretrievable and possibly irreversible, with particularly serious consequences to the significant retired population of the area.

CHAPTER 8

Page 8-49 It is Foothills' understanding that the Cross Puget Sound route is now Northern Tier's prime route. The cross sound route is 73 miles shorter than the route around the sound but involves about 20 miles of submarine pipeline across the Strait of Juan De Fuca and the Saratoga Passage. The EIS contains considerable criticism of this route on pages 8-49 to 8-57.

Temporary local combustion emission and noise will occur during construction and permanent landscape impacts will result where the line descends a 40-foot bluff to the water and ascends a 100-foot bluff.

Page 8-50 The route traverses an area of moderate to high seismic activity. This area has been designated as Risk Zone 3 (maximum earthquake damage expected).

Potential Slope instability problems exist near Port Williams, Point Partridge and Duvall.

All of the river crossings are classified by Washington as extra-ordinary or excellent in quality.

Page 8-51 Underwater pipeline crosses under ship traffic lanes. Anchors could be hazardous. A leak detection system capable of sensing a 0.5% loss could allow a leak of up to 3500 barrels per day to go undetected until visually noticed.

Page 8-54 Construction of the marine pipeline would degrade the water quality in the Strait. This will be particularly serious in Saratoga Passage where water flow is restricted. Clam beds off Kulakala Point and Protection Island would be partially destroyed. Water fowl and harbour seals would be disturbed. A submarine pipeline spill would significantly degrade water quality throughout the eastern part of the Strait. Clam beds, salmon fisheries and waterfowl would be seriously impacted.

CONT

Page 8-55 670 acres of forest land would be cleared.

Page 8-56 Construction through residential Oak Harbour would create high visual impact. Submarine pipeline construction barges would present a hazard to normal marine traffic.

Page 8-57 During construction, community services in Island County might be strained. Clallam and Jefferson Counties would experience housing pressure. Construction costs would be about $9.3 million greater than those for the previously proposed route.

(54) Page 8-98 and following pages The description of the Foothills project in the Northern Tier Draft Environmental Statement was based on the June 1978 "Oil Transportation Studies" and is therefore out of date in many respects. The changes are such that much of the section will require a total rewrite to reflect modifications made to the proposal in Northwest's December 8, 1978 application to the DOI and additional modifications made since that time. However, the following updated information should be especially noted.

Foothills' prime proposal is to construct a marine terminal and storage facilities at the Port of Skagway, Alaska to receive Alaskan and foreign oil delivered by ocean-going tankers. The proposal no longer calls for using the Port of Haines for any trans-shipment, and any references to Haines should therefore be deleted. The Skagway marine terminal will initially receive 400,000 barrels per day of heavy Alaskan crude oil and 100,000 barrels per day of light crude from offshore sources. The crude oil will be delivered to Skagway in varying sized tankers, ranging in size from 80,000 dwt to 160,000 dwt from Alaska, and possibly as large as 270,000 dwt from offshore. In another change from the proposal as filed, a new dock will be constructed, 1,500 feet south of the existing cargo dock.

From the Skagway marine facility, the pipeline would follow the existing right-of-way of the White Pass and Yukon Railway, which has recently become a partner in the project.

to a point on the Alaskan Highway Gas Pipeline Project right-of-way near Johnson's Crossing in the Yukon Territory. At Johnson's Crossing, the system would converge with and follow the right-of-way of the gas pipeline for approximately 400 miles to a point near Fort Nelson, British Columbia. For the final leg of the route, the pipeline would leave the gas pipeline right-of-way at Fort Nelson and proceed approximately 57 miles to Keg River, across an active oil and gas exploration and producing area already traversed by two major gas gathering lines. Existing pipeline systems will be used south of Keg River.

In total, the project will require the construction of a pipeline primarily of 34-inch diameter, from Skagway to Keg River, Alberta, a distance of 710 miles (consisting of 14 miles in Alaska, 394 miles in British Columbia, 246 miles in the Yukon Territory, and 57 miles in Alberta), with an initial design throughput capacity of 500,000 barrels per day. The system will require one pumping station in Alaska with 30,000 installed horsepower and seven pumping stations in Canada, each having installed power of 19,500 horsepower. The capital costs for the project are estimated at $ U.S. 919 million.

Two main alternative pipeline systems have been considered in detail, these being a Skagway to Edmonton pipeline and a Delta Junction to Keg River pipeline. These alternatives are described below.

CONT

Skagway to Edmonton Alternative - Under this alternative proposal, the pipeline from Skagway would terminate at Edmonton rather than Keg River, resulting in 1097 miles of new 34-inch diameter pipeline (consisting of 14 miles in Alaska, 474 miles in British Columbia, 246 miles in the Yukon Territory and 363 miles in Alberta). Thirteen pump stations would be required, one in Alaska having 30,000 installed-horsepower and 12 in Canada having 19,500 installed horsepower each. The estimated capital costs of this alternative system are $ U.S. 1234 million. This alternative would be selected if the use of existing systems between Keg River and Edmonton proves to be impractical.

Delta Junction to Keg River Alternative - Under this alternative proposal, 500,000 barrels per day of Prudhoe Bay oil would be delivered into the Alaska Highway Oil Pipeline from the Alyeska pipeline at that company's Pump Station No. 9 near Delta Junction, Alaska. Storage facilities would be constructed at Delta Junction and a 34-inch diameter pipeline would be constructed from that point to Keg River, Alberta, a distance of 1119 miles (consisting of 186 miles in Alaska, 512 miles in the Yukon Territory, 364 miles in British Columbia and 57 miles in Alberta). Thirteen pumping stations would be required in Alaska and Canada, each with 19,500 installed horsepower.

Additional specific comments follow.

(55) Page 8-99 Alaska Highway Pipeline Study Number 2, Skagway Alaska to Edmonton, Alberta

The pipeline would not follow the highway on the west side but would use the railroad right-of-way along the east side to milepost 14 and then use the railroad right-of-way again at milepost 20.

A floating dock would be used at Skagway (nothing at Haines) and a 2-1/2 mile pipeline would connect the berth with the tank farm on the west side of the river, in the valley on the location of the existing tank farm. There would be no tank farm at Haines, and the Skagway tank farm would require about 80 acres for its 4,000,000 barrels of storage.

Page 8-101 Status of Foothills Proposal

(56) This paragraph does not truly portray the status of the Foothills proposal. An application was submitted to the DOI by Northwest on December 8, 1978 and an application by Foothills to the National Energy Board will be filed shortly. The paragraph further misrepresents the status of the proposal by distorting the conclusion of the September 1978 National Energy Board Oil Supply and Requirements report, which was that additional Canadian port facilities were not required to meet Canadian demand. This conclusion cannot be applied to the Foothills proposal which is to construct a port at Skagway (U.S. territory) for the receipt of Alaskan and offshore crude oil to be transported to the lower 48 states.

Page 8-116 Table 8.4.3.9-1

(57) The Foothills portion of this table requires revisions to reflect the latest information. In addition, transportation costs are not compared on an equal basis (i.e., total system costs are mixed with partial system costs). Therefore, transportation costs should be restated for Port Angeles, Kitimat and Trans Mountain to show Valdez-to-destination prices and the Foothills caption should be corrected.

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GENERAL COMMENTS - SOCIO-ECONOMICS

The Alaska Highway Oil Pipeline project has significant advantages over the Northern Tier Pipeline project in the area of potential social and economic impacts.

The most obvious contrast is in the very numbers of people potentially affected. Even within the narrow corridor considered by Northern Tier in the assessment of impacts, the populations involved are significantly greater than in entire regions traversed by the AHOP project in both the United States and Canada. The differences in population size between Port Angeles and surrounds, and Valdez and surrounds, where port and tanker facilities are proposed, are particularly significant, given the more extensive impacts of such facilities compared to the impacts of pipeline construction.

The large number of communities affected by the Northern Tier proposal in itself limits the company's ability to accurately assess impacts with any degree of comprehensiveness, and will even more severely limit the company's ability to assist communities in planning and mitigating impacts, especially if the company adheres to its 22-month construction schedule. In contrast, the smaller number of communities along the AHOP route will facilitate effective corporate assistance in identifying and mitigating potential impacts. In addition, the majority of the communities along the Canadian portion of the AHOP route have already gained experience in assessing and planning for pipeline impacts in preparation for the construction of the Alaska Highway Gas Pipeline. Most of the data and experience gathered in preparation for the natural gas pipeline, by both company personnel and community members, will be directly transferable to the AHOP project.

Local and regional governments and relevent service organizations and institutions along the AHOP route have already been involved in the planning of a major pipeline project with the Alaska Highway Gas Pipeline, and many of these have specifically appropriate staff (pipeline coordinators, planners, etc.) already in place. The additional demands on local and regional resources and manpower to prepare for orderly implementation of the AHOP project would be no more than incremental for a large part of the route.

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April 2, 1979

Mr. Hoyt
Bureau of Land Management
1250 Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Dear Mr. Hoyt:

As representative of the Crosswoods Homeowner's Association located on Swantown Road in Island County, Oak Harbor, Washington, we as residents would like to go on record of being in total opposition to the northern tier route alternative which crosses Whidbey Island. It is very evident from the environmental impact statement that a more indepth study has to be accomplished before a certificate or permit should be issued. Various areas of the environmental analysis indicate more information is definitely needed to prevent any and all potential disasters to the Island County residents.

Therefore, this letter should go on record as being in opposition to the alternate route of crossing from Camano to Island counties.

Sincerely,

D. T. Gilligan

D. T. Gilligan, President
Crosswoods Homeowner's Association
1140 W. Crosswood Drive
Oak Harbor, Wa. 98277

DTG:cs

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Cascadia Research Collective
P.O. Box 1434
Olympia, WA 98507
1 April 79

Bureau of Land Management
700 N.E. Multnomah
Portland, Oregon 97232

To Whom it Concerns:

I wish to submit written comments on the Northern Tier Pipeline Company's Crude Oil Transportation System Draft Environmental Impact Statement. In light of the 23 March 79 public announcement of the Company's decision to route the pipeline under Puget Sound, instead of the originally proposed route, more time is necessary for adequate review of the Draft Environmental Statement. Because this is the last stage in the NEPA process for direct public review and comment, the public must be given enough time to consider the special impacts associated with the cross Sound route.

① The Northern Tier Pipeline Company's press release states that it "developed extensive engineering and environmental studies before concluding this new route to be technically and environmentally sound." How will this new information be be made publically available, so that people considering the potential impacts of the proposal will have the same information as the proponents? Will there be a supplemental draft Environmental Statement to encompass it?

If the information refered to by the Northern Tier Company is not from new studies, then why was the change in the proposed route made so late in the process? By changing the proposed route, they have attempted to downplay the serious risks and adverse environmental impacts of the cross-Sound route. When compared to the originally proposed route around the Hood Canal, it appears less severe. The cross-Sound pipeline route would cross fewer major streams and rivers and would not follow along the important estuaries and resources of the Hood Canal. But there would still be substantial adverse environmental impacts to the resources of Washington State from the port facility at Port Angeles, the storage area on Green Point, and the pipeline.

There is insufficient information in the draft Environmental Statement on existing conditions of the marine ecosystem of Puget Sound and terrestrial areas that would be affected by the pipeline route, the engineering design of the submarine pipeline, and potential impacts from the cross-Sound route. The map alignment sheets, which are supposed to describe the route and impacts in detail, are not provided for the cross-Sound route.

② Do submarine pipelines similar to the proposed, presently exist elsewhere? Are they submerged in water as deep or their distance as long? What has been the accident history with these other pipelines? What engineering safeguards will be incorporated into design of this pipeline to prevent leakage?

What subtidal resources exist in the pipeline corridor through Puget Sound? What could be the disruption and damage to these? How will the pipeline be laid through the Sound, and how deep would it be buried? If dredging is done in the process of pipeline burial, what will be done with the spoils?

③ I am concerned about the area of moderate to high seismic activity the pipeline will cross through the Sound. Why isn't this area mapped in the DES, or the information about it referenced? Who has determined that this seismic activity is not related to known surface faults, or that the seismic activity would not cause disturbance to the pipeline?

④ Would the pipeline be buried along the Straits as it descends the 40' bluff at Pt. Williams or ascends the 100' bluff at Pt. Partridge? It appears that the pipeline route through these steep bluffs would cause serious erosion and aesthetic damage. Are any alternatives to these routes or mitigation measures proposed?

⑤ How close would the cross-Sound route be to the Skagit Wildlife Recreation Area or state parks on Whidbey Island?

With either the proposed pipeline route around the Hood Canal or across the Sound, there would be serious impacts to the natural resources of Washington State. The full extent of the natural resources potentially affected by this project is not given in the existing environment section of the DES. Without this information it is impossible to gain a clear picture of the extent of adverse impacts to these resources. The DES states that "a description of all the resources involved is so complex that a clear picture of the potential impacts could not be drawn." Because the resources involved are so complex, they must be discussed in greater detail in order to present a clearer picture of the potential impacts. The discussion of impacts from the cross-Sound route was even less complete then for the originally proposed route in the DES.

⑥ The inadequacy of information on marine resources is exemplified by the map addendum, frequently refered to in the text as a place to find more information. The maps are rarely referenced or explained with a key. The marine mammal and waterfowl concentration maps are vague and innaccurate. Many of the important harbor seal haul out and pupping areas at river deltas along the Hood Canal, in Northern Puget Sound including the San Juan Islands, and in Southern Puget Sound are not shown. Designation of an area as a waterfowl concentration area does not provide sufficient information about seasonal fluctuations or abundances, breeding populations or use of areas by shorebirds, seabirds, or other types of birds.

The State of Washington is expected to surrender the quality of its marine environment of Puget Sound for this crude oil transportation system, through high risk of devastating damage from oil spills, as well as chronic pollution. The DES states "there will be oil spills." "Small spills less than 100 gallons during oil transfer operations would be fairly frequent. It is likely they would all be contained and cleaned up." Has this type of clean up been done successfully at other ports around the world?

⑦ The DES states that the risk of oil spills was derived from historical in-transit tanker spill rates. But has there ever in history been this much petroleum shipment? Or tankers this large? Or this much traffic on the Strait of Juan de Fuca and all Washington State waters? These factors must be taken into account in determination of oil spill risks. Also, the additional risks of spills from fuel barges must be shown. The risks for spills between 100 gallons and 2000 barrels of oil must be determined. The risks of spillage from an undetected rupture in the submarine pipeline must be discussed in greater detail.

The DES mentions that there would be restrictions on bilge or ballast pumping in Port Angeles harbor. Even if ballast pumping wasn't done in the vicinity of the harbor, it could be done in the Straits, and thus effect the water quality of the Sound. And how will these restrictions be enforced?

The environmental effects of similar ports which already exist throughout the world must be described and referenced. This must include data on chronic pollution associated with ports, as well as tanker spills.

In addition to the impacts to Washington State resources, there would be impacts to nationally important areas, the Dungeness and Smith Island National Wildlife Refuges and Olympic National Park, from the oil port operations at Port Angeles.

The DES states that habitat losses and disturbances on Green Point would cause species inhabiting and frequenting the site to relocate. Throughout other sections of the DES describing the pipeline route this relocation idea is also given. However, the concept of carrying capacity for habitats must be applied to these discussions. When habitat is destroyed the organisms that depended on it cannot simply go someplace else. The individuals and populations of many species would be harmed or destroyed.

The people of Washington will not recieve the benefits of energy from this energy facility. In fact, it would place increased demand on the electricity supplies of the state. The DES admits that this is an unsolved problem. This serious issue must be more comprehensively addressed.

Resources which provide livlihood for thousands in the state would be sacrificed in the long run; shellfish, commercial and sport fishing, and the tourist industry. These valuable resources could not be replaced in 20 years, once the economic lifespan of the pipeline is over. After 20 years would we find that the environmental costs have been worth it, with such high risks to the food resources of Puget Sound and other Washington waters?

The economic costs to the state resulting from the project must be better described, including losses from degradation of marine and aquatic resources, changes in the quality of life, and effects on human health from hydrocarbon emmissions and petroleum contamination.

The public, through decisions made by elected officials and government agencies, must decide whether the benefits from the Northern Tier Pipeline would be worth the costs. In order to assess the benefits, an adequate description of the need for this facility must be presented. It must be shown that implementation of this proposal would fulfill a pressing need that could not be satisfied by other methods less destructive to the environment.

The need for this facility must be substantiated in the DES with more data. The scope and content of the DES must be more complete in order to comply with NEPA. This DES is only one part of the process of discussion and evaluation of energy and crude oil needs in the Northern Tier states, as well as the entire nation. But if the need for this proposed facility is not carefully evaluated in the DES, can we be assured that it will be done elsewhere? The U.S. Department of Energy's "Draft Report on Petroleum Supply alternatives for Northern Tier and Inland States through the year 2000" is supposed to address the need for this proposed facility. But it does not appear to contain detailed cost benefit analysis, consider the costs to Washington's natural resources or citizens in the long run, or propose alternatives that would significantly decrease the need for crude oil in the Northern Tier states.

There may be solutions to the energy problems in the Northern Tier states consisting of a combination of many alternatives, instead through a massive 1.8 billion dollar project. People in the Northern Tier states presently need petroleum products for transportation, space heating and electricly. In the future some of these needs can be satisfied by means other than petroleum. They are going to have to be, since petroleum is a limited resource. In 20 years, at the end of the economic lifespan of the pipeline, the needs will still be there unless we start to change the situation now. We should not speed up production of the Alaska North Slope crude oil, because that just means we will deplete the resource faster.

Ambitious programs for solar energy and conservation measures must be started now, while we still have the petroleum to implement them. In the long run, $1.8 billion towards solar and conservation technology would better serve the consumers of the nation, than the proposed pipeline would.

In the DES discussion of need for the facility, it states that "solar energy would only slightly increase by 2000." This assumption is not supported and is very biased. Solar technology exists and will be implemented on a larger scale when the economic obstacles are lessened. These potential effects of implementation of solar energy and conservation measures on the total enecgy needs in the Northern Tier States must be considered.

For these reasons I find this DES on the Northern Tier Pipeline Company's Crude Oil Transportation system inadequate, and that it fails to comply with NEPA.

I oppose the Northern Tier Pipeline proposal, and all transshipment of crude oil in Washington State waters.

Sincerely,

Pam Miller

Pam Miller
Field Biologist

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**148**

R. Scott [illegible]
Stony Creek Ranch
Huson, MT.
59846

Dear Sirs,

I am a landowner in the 9-mile Valley north-west of Missoula Mont. I do not want to see the NTP to go through. I feel the DES is inadequate for these reasons;

① ① No where is there mentioned what species of plants will be re-planted.

② ② No where is there mentioned how the various soil layers will be replaced in order to insure no loss of top-soil.

③ ③ No where is there mentioned how the many small creeks will be crossed, there are 21 alone to be crossed in the 9-mile Valley. Are water table is extremely fragile and disruption which would undoubtably occure of the water system would definitely impair the lives of all the residents of this valley. Surface water is essential for livestock, irrigation and human use. During construction alone oil and diesel fuel from heavy equipment would contaminate these waters. NO provision is made for where the water for Hydrostatic Testing would come from and as to where the contaminated water from such testing would be dumped.

**CONT.**

④ ④ No erosion studies have been done.

⑤ ⑤ NO wildlife impact to our valley has been addressed.

⑥ ⑥ NO mention of where the pump station storage areas and construction camps locations has been addressed.

⑦ ⑦ NO mention of where the power to run the pump stations is to be found

⑧ ⑧ THE NEED HAS NOT BEEN PROVEN

⑨ ⑨ NO mention of who will arbitrate between the land owner and NTPC has been considered.

⑩ ⑩ Who will be responsible for livestock containment during construction?

⑪ ⑪ NO where is there a provision for weld X-rays.

⑫ ⑫ The leak detection system allowing 4,665 barrels per day to leak undetected is inadequate.

⑬ ⑬ The fire danger is not addressed.

⑭ ⑭ The impact on our county road is not addressed ~~as~~ as to heavy equipment traffic.

⑮ ⑮ Our property values which is proven will lower - is not mentioned.

⑯ ⑯ The possibility of conversion to a gas line or coal slurry is not considered. Land owners have the right to know this.

⑰ ⑰ NO statement is made on the impact to Siegel Creek and Siegel Pass which would have to withstand road widening - this is not acceptable.

⑱ * ⑱ NO where is there mentioned the disastrous effects transmissions lines would have if they inevitably followed this pipeline. - THIS MUST BE ADDRESSED by NORTHERN TIER + SENATOR MELCHER WHO REFUSES TO LISTEN TO HIS CONSTITUENTS.

⑲ ⑲. I FAIL TO SEE THE NEED FOR A 50 FT. RIGHT OF WAY. THE REASON IS NOT SO STATED IN THE DES.

Lastly gentlemen, the 9-mile valley is very narrow and not very long, our valley is beautiful and we work hard at maintaining a life style we have all worked hard and sacrificed to obtain. We are not wealthy in terms of dollars. Our wealth springs from the beauty and life of our valley. The pipeline would destroy our valley and our way of life. It is to small a valley to be saddled with a pipeline and

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CONT

Transmission lines. No one will listen to us. There are other alternatives and I believe there are more that haven't even been considered. I strongly feel we are being treated unfairly by NORTHERN TIER and Senator Melcher testify, despite the soft-sell by Northern Tier and Senator Melcher, I want to know who the hell can estimate the impact to me my family and my land – that takes a lot of gall and I am angry!

R. Scott Benson
Stony Creek Road
HOBSON, MT
APRIL 2, 1979

*⑰ – A 1500 mile pipeline through 1,100 miles of private land seems to be completely out of order.

⑱ – Why is there no mention of the problems encountered and the many failures and mistakes on the Alaska Pipeline?

RECEIVED APR 4 1979

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149

AtlanticRichfieldCompany
Products Division
Cherry Point Refinery
Post Office Box 1127
Ferndale, Washington 98248
Telephone 206 384 1000

Fielding Formway
Manager
Refinery

April 2, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Lloyd Building, Room 1250
700 N. E. Multnomah
Portland, Oregon 97232

Re: BLM Draft Environmental Statement - Crude Oil Transportation System: Port Angeles, Washington to Clearbrook, Minnesota (as proposed by Northern Tier Pipeline Company)

Gentlemen:

This letter presents Atlantic Richfield Company comments regarding the above referenced Draft Environmental Statement (DES). These comments are limited to the aspect of the DES that concerns the proposed project's capacity to supply "350,000 bpd of crude oil to four existing refineries located on the east side of Puget Sound" (DES, page 3-6), as well as to refineries in the Northern Tier states. Concerning this additional capacity, we feel that there are two important points that your Environmental Statement (ES) and your permitting process should consider.

I.

① The stated rationale for the proposed additional capacity to supply four existing Washington State refineries does not represent Federal or Washington State policy, and in fact may soon be removed altogether from the Washington State Coastal Zone Management Program (WCZMP); therefore, this additional capacity should be deleted from the proposal.

As indicated in your DES, the additional capacity required to supply four existing Washington State refineries was included in the Northern Tier proposal in response to a statement inserted by former Governor Daniel J. Evans into the WCZMP. This statement provided that "a single, major crude petroleum receiving and transfer facility at or west of Port Angeles . . . shall be designed to include provisions to supply existing refineries in Whatcom and Skagit Counties." (DES, page 3-6)

As your DES notes (pages 4-5 & 6), the State of Washington has requested that the "Evans Statement" be deleted from the WCZMP, and the National Oceanic and Atmospheric Administration (NOAA) Draft Environmental Impact Statement (DEIS) for this proposed

CONT

action is presently undergoing public review. In this regard, your ES should further note the following:

1. Even as part of the WCZMP, the Evans Statement has no legal force since it was inserted without the public notice and hearings required by federal and Washington law. Having been repudiated by the State, the Statement represents neither Federal or Washington State policy.

2. There is a strong likelihood that NOAA soon will delete the Evans Statement from the WCZMP. NOAA's DEIS concludes "the Evans Statement lacks binding force under either State law or the Federal Coastal Zone Management Act" (page 32), and recommends deletion of the statement.

Based on the foregoing considerations, your ES should reflect the fact that the Evans Statement is of no effect and therefore is not a valid rationale for the additional pipeline capacity included in the proposal to supply four Washington State refineries.

Except for the Evans Statement, your DES reveals no rationale for this additional pipeline capacity. In addition, Atlantic Richfield Company and, as we understand, the other northern Puget Sound refiners, have expressed no interest in being included in the project, nor does the project's economic viability purport to depend on the additional revenues that supplying four existing Washington State refineries would produce. Further, the cost of this expensive additional capacity would be borne through increased pipeline tariffs by all shippers using the line and, ultimately, by consumers of petroleum products throughout the Northern Tier states. Based on these additional considerations, your ES should conclude that, there being no rationale for this additional expense, the additional pipeline capacity to supply four existing Washington State refineries should be deleted from the Northern Tier Pipeline Company proposal.

II.

It should be made clear that your ES does not cover supplying crude oil from Port Angeles to four existing Washington refineries.

As noted above, your DES alludes to the possibility of supplying crude oil by pipeline from Port Angeles to four existing Washington refineries. Your document in no sense, however, could constitute an ES on this possible use of the proposed facility. The primary reasons for this are that it does not address the environmental impact of this possible use as compared with the alternatives (for example, the present system of supplying these refineries directly by tanker), and that it contains no analysis of the relative economic effects of supplying four existing Washington refineries by pipeline from Port Angeles.

Concerning the latter point, your DES contains the statement that "lower product costs to users of petroleum products might result" from the project (SUMMARY). Clearly this statement does not consider the project's potential use to supply four existing Washington State refineries, for it is beyond dispute that supplying these refineries through the proposed pipeline would be far more expensive than supplying them directly by tanker, as is presently done. Thus, this aspect of the project inevitably would produce higher costs to Washington State consumers of petroleum products and, concomitantly, render products produced by four existing Washington refineries less competitive with out-of-state products.

CONCLUSIONS

Our primary conclusions concerning those aspects of your DES which deal with the proposed additional capacity of the Northern Tier pipeline to supply existing Washington State refiners are as follows:

1) Your ES should specify that the proposed additional capacity to supply four existing Washington State refiners is not required by any policy of the State of Washington or the federal government, that it would create a needless cost burden on those who are dependent on the pipeline, and that this additional capacity therefore should not be included in the proposal.

2) Your ES should clarify the fact that if the proposed facility ever were to be expanded to supply Washington State refineries a supplemental ES would be required.

Thank you for your consideration of these comments.

Sincerely,

Fielding Formway
Fielding Formway

FF:mm

cc: Honorable Dixy Lee Ray
Governor of Washington

Mr. Nicholas D. Lewis, Chairman
Energy Facility Site Evaluation Council
Washington State

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150

STEVE SHAPIRO, M.D.
FAMILY PRACTICE
321-5272

THE LANGLEY CLINIC
P.O. BOX 137
LANGLEY, WA 98260

April 2, 1979

Bureau of Land Management
Northern Tier Project
Lloyd Building
Room 1250
700 N.E. Multnomah
Portland, Oregon 97232

Sirs:

① The existing environmental impact statement on the Northern Tier Pipeline Project is incomplete. Northern Tier is now proposing a pipeline route under Puget Sound and across Whidbey Island. The EIS does not address the environmental impact on these areas.

A new EIS should be prepared or the under sound-Whidbey Island route should be abandoned.

Thank you very much for your attention to the matter.

Sincerely,

Steve Shapiro MD
Steve Shapiro, M.D.

SS:cc

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151

Mr. Murl W. Storms
Oregon State Director
U.S. Dept. of Interior
Northern Tier Project
Rm 1250
Lloyd Building
700 Multnomah
Portland, OR 97232

April 1, 1979

These comments are written as a response to the BLM, Draft Environmental Statement on the Northern Tier Oilport and Pipeline proposed project.

The apparent usage of information from the same consultants who performed the Northern Tier DES cannot be considered an adequate investigation of the impacts of this project. It is necessary to develop an independent set of empirical data from unbiased investigations from a controlling government agency such as BLM to accurately assess possible impacts and effects of the Northern Tier proposal.

① The extent and impacts of air quality degradation as discussed in the DES are questionable and the discussion on such matters is totally inadequate. There is research to support the theory that increased hydrocarbon air pollutants from a project the size of the proposed Northern Tier installations and the handling of large amounts of crude oil may retard the growth of commercially important timber and food resources within a radius of many miles of the source of pollution.

② Some analyses seem to show that the probability of oil spillage from a submarine oil pipeline are essentially the same as oil spillage probabilities from surface tanker traffic. The probable [illegible], most likely, may be the same in the event of a spill. In spillage from a tanker on or near the surface, a large percentage of the volatile fractions in the crude evaporate. In a pipeline spill of equivalent size, the lighter, more volatile fractions are mixed into the water column, instead of evaporating, causing a much larger total effect on the marine ecosystem. It is the lighter fractions which are the most toxic and the hardest to remove from the water. The added impact of submarine pipeline spills has not been adequately addressed.

[illegible] (as of April 1) of the exact, proposed pipeline route. Attempts at performing necessary impact studies are [illegible] until an exactly proposed route can be defined. [illegible] apparent, possible route revisions [illegible].

③ [illegible] are extremely high in the [illegible]

④ [illegible]

CONT

[illegible] oil pollution [illegible] 200 miles of its source. This area includes Pacific coast waterfront as well as major portions of those shorelines facing the inland waterways of Puget Sound and all associated tidal flats and estuarine systems. Effects on the areas may include; destruction and/or decertification of shellfish beds, disruption of bird sanctuary and nesting habitats, reductions in the year-class numbers of commercially important fish specs, despoliation of recreation and park facilities affecting tourist acceptability, reduction in general fishing activity, fouling of fishing gear and resultant economic losses. Other effects on commercial and non-commercial activities and contributing shorelines have been documented and can be added to this list.

⑤ Secondary and tertiary problems will also arise. Disposal of cleaned up oil spill waste has been a major problem. Disposal in traditional land-fill sites can lead to severe ground water contamination. Incineration of the collected wastes leads to direct and severe air quality degradation. Any major or chronic spillage of oil into the waters connecting with the Straits of Juan de Fuca will eventually if not immediately lead to water quality degradation in a double A class waterway.

⑥ The depth of local opposition to the proposed project has not been addressed in any study bearing upon a decision in this matter and a clear indication of need for oil to be delivered by the transshipment facilities is completely lacking. Indeed, it seems as if the project environmental impact studies have been structured to favor the installation of the oil port and pipeline without true regard for public input and regardless of the actual existance or nonexistance of need in any of the Northern Tier States or Washington.

In all, the BLM DES is a sloppy and noninclusive attempt at identifying the possible and probable effects of this proposed project upon the human and other natural environments surrounding the project area. It must be revised to reflect the true, and fully quantified impacts possible from the construction, operation and maintenance of the oilport and pipeline facilities.

Levi Ross
Levi Ross
Jefferson Co. citizen
324 'W' St.
Port Townsend, WA 98368

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152

Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Ore. 97232

Dale A. Gunderson
Box 186
Thompson Falls, MT 59873
Phone: 827-4455
March 31, 1979

Dear People:

Upon reviewing the draft Environmental Impact Statement (EIS) prepared by your office, I have found it inadequate in several areas:

① (1) Concerning stream and river crossings-
How will all this heavy equipment get across rivers and streams? Will bridges be built? What additional impacts will this have on the stream or river, and to its fish and wildlife.

② (2) Regarding energy resources to operate the pump stations-
The Northern Tier Pipeline (NTP) would consume nearly six million KWH of electrical power per day. Montana will no doubt have to supply part of this power. What impacts will this have on Montana's power resources? It could cause increased strip mining of coal and associated thermal generation impacts in eastern Montana.

③ (3) Social Impacts to Montana-
Life styles in Montana and the impacts the pipeline will have during and after construction, in terms of attitudes the people will have. This was not addressed to specific areas that would be affected by the pipeline.

④ (4) Regarding discharge of water-
Upon completion of pipelines, they are required to be filled with water in order to check for leaks. Where will this water come from? And when discharged from the pipeline, will it go back into the stream as dirty (rusty, oily) water? This will cause impacts on aquatic insects, fish and wildlife. Also erosion problems may occur when that much water is discharged at great pressures onto dry land.

⑤ (5) Minor oil spills during construction-
These spills generally occur when equipment maintenance is needed. The procedure (from what I have seen) is to change the oil where ever the equipment is and to dump the oil on the ground. It may seem like a small amount but these amounts add up. These impacts were not addressed.

⑥ (6) Concerning Inspections of the pipeline-
What kind of inspections will be made, during and after construction? The Alaskan Pipeline seems to have had many regulations and engineering inspections; but still there were many things that went wrong, three major oil spills before the pipeline reached Valdez, a major blow-up, the demise of stream habitat, and erosion problems, these are only a few problems. How will these problems be dealt with in the field during construction? Extensive inspections must be made to eliminate these problems.

⑦ (7) Need for the oil
The assessment of the national need for Alaskan crude oil and its useability on the west coast was ignored in the EIS.

⑧ Montana presently exports 2/3 of the crude oil produced in the state. What are alternatives to this situation? Could there be a redistribution of this supply to Montana refineries?

It seems as though this impact statement was not adequate in many areas. A project impacting so much land, its people, its wildlife, and its vegitation should evaluate its impacts adequately. It is essential that we spend more time and careful thought about what we are doing to the land and its inhabitants.

Thank you for your consideration concerning the comments in your final EIS.

Sincerely yours,

Dale and Candi Gunderson
Dale and Candi Gunderson

cc: President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee

**153**

A PETITION

We, the undersigned residents of the Helmville-Ovando Valley, along the proposed route of the Northern Tier Pipeline do strongly oppose the proposed "Hineville" to Helmvil's Route" for reasons herein stated.

A: Detrimental Economic Influences
1. Large numbers of short term workers cannot be facilitated.
2. Helmville-Ovando merchants aren't equipped for a large influx of transient workers.
3. School systems aren't large enough to accomodate transient workers children.
4. Road conditions would suffer severely.

B: Detrimental Environmental Impact
1. This is a documented meeting area for several species of waterfowl and Eagles, including the Sandhill Crane, Blue Heron, Osprey, Golden Eagle and Bald Eagle. The conditions necessary for these species to exist may well be severely disturbed by construction of the Northern Tier Pipeline.
2. Increased access and availability to hunting of the Deer and Elk population.
3. Decrease in amount of already scarce agricultural land.
4. Shallow water tables in the area would be polluted by oil leaks and disturbed by construction.
5. Increased pollution of the air and water as well as increased noise level during construction and after.

① [illegible]
② [illegible]
③ ~~[illegible]~~ Edward M. Coughlin Box 78 Helmville, MT. 59843
④ Elizabeth Clifford Box 59 Helmville, MT 59[illegible]
⑤ Selma Cockrum [illegible]
⑥ April McCoughlin Helmville, MT [illegible]
⑦ [illegible]
8 Jill Coughlin
9. Hazel Coughlin
10 [illegible] Shelley
11 JoAnn Hackman Box 56 Helmville, Mont 59[illegible]
12 Gay + Sandy Hutt
13 [illegible]
14 [illegible]
15 Patricia D. Geary
16 Beverly M. [illegible] Box #62 Helmville, Mont 59[illegible]
17 [illegible] Box 75
18 [illegible] Box 75
19 [illegible]
20 [illegible]
21 [illegible]
[illegible]
John T. Geary - Box [illegible] Helmville Montana - 59843
Stephen Bruce Hamilton PO 75 Helmville Mt. 59843
Kathy Daniels - Helmville, Mt 59843
[illegible] Helmville
Eugene [illegible] Helmville MT 59843
Lawrence B. Dodge — Helmville, Mt 59843
[illegible] Helmville Mt.

[illegible]

Copies of this document will be sent to:
1. BLM-Northern Tier Project, Rm. 1250, Lloyd Building, 700 N.E. Multnomah, Portland, Oregon
2. President Jimmy Carter, Whitehouse, Washington D.C. 20500
3. Secretary of the Interior Cecil Andrus, Dept. of the Interior, Washington, D.C.
4. Senator [illegible], U.S. Senate, Washington, D.C. 20510
5. Senator John Melcher, U.S. Senate, Washington D.C. 20510
6. Congressman Pat Williams, House of Representatives, Washington D.C. 20515
7. Congressman [illegible], House of Representatives, [illegible]
8. [illegible]

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**154**

For the Official Record

April 1, 1979

Mr. Hoyt
Bureau of Land Management
Room 1250 Lloyd Building
700 Multnomah Ave. NE
Portland, Oregon 97232

Dear Mr. Hoyt:

I have just received and read pages 8-49 to 8-57 of the draft environmental impact statement concerning Northern Tier Pipeline Company's application for an oil pipeline crossing the Strait of Juan de Fuca, Whidbey Island, Saratoga Passage, Camano Island, etc. and I wish to submit several comments regarding the report and the application.

I am disturbed by the admitted lack of geologic knowledge of the Saratoga Passage crossing and either the lack of knowledge or lack of mention of any possible recent or active faults in the vicinity of either of the water crossings.

The Puget Sound area, along with much of western Washington, is part of the "Circum-Pacific Mobile Belt" which is a zone or belt of active crustal deformation extending along the west coasts of South, Central and North America, along southern Alaska through Japan and the Phillipines. It is a zone of major geologic disturbances, typified by volcanism and earthquakes—two phenomena unfriendly to the works of man, such as pipelines, buildings, canals and so on.

1 Any pipeline crossing this general area must cross a number of faults, any one of which might slip and result in ground surface breakage and an earthquake. Unfortunately, I have no mapping of this area showing the location of known active or recent faults and no personal knowledge of faulting of the sea bed in the Puget Sound area. However, detailed maps of the Canadian Gulf Islands and Vancouver Islands show numerous faults on land and inferred faults between the islands. The supposition that similar fault patterns may be expected across the international border seems geologically valid. I presume that such mapping for this area would be available to the Bureau and am surprised it was not dealt with in more detail. Has such mapping and/or subsurface exploration been performed by the applicant?

The supposition as noted under the paragraphs headed "Topography" that "Historical records indicate a low probability of a large magnitude earthquake (6+ Richter scale) occuring near the pipeline within the next 50 years", is to me quite questionable. I feel that a major earthquake could occur anytime. It seems that there is often a tendency to believe only that which we wish to believe and I feel that such possibilities should be recognized and faced squarely. Statistics, particularly of the above nature, could be used to prove almost anything desired.

This letter is being written only because to my mind there is a most viable and attractive alternate to the Northern Tier proposal which should be considered carefully. It appears to be the most sensible, and feasible and least disruptive of the 5 oil pipeline routes now under consideration. It is the Skagway-Foothills Pipe Lines (Yukon) Ltd. route. The most apparent advantages of this route follow:

1.) The route would have a minimum tanker haul with a resultant decrease in the changes of a disasterous oil spill from either man-made causes or natural causes, such as severe storms.
2.) Except for the short pipeline from Skagway to the Alaska Highway, the line would use the same right-of-way as the Foothills gas pipeline already generally agreed to between the Canadian and U.S. governments, with a consequent major cost-saving.
3.) It would be east of the Rocky Mountains and tie into an already established distribution system which with some looping and minor new lines could readily supply the needs of western Washington as well as of the north central states.

Such a route is generally over much more stable terrain where earthquakes and volcanism are almost unknown. Stable too, is the political situation with Canada where a pipeline treaty with the United States, which presumedly would cover an oil pipeline as well as the gas pipeline, was recently agreed to.

By routing the oil along this line the danger and serious consequences of major oil spills would be eliminated along the beautiful shorelines of Canada and the United States in the vicinity of the Strait of Juan de Fuca and the Puget Sound.

I feel quite strongly that the needs of the people of Washington as well as the betterment of their environment can better be served by the Skagway-Foothills plan than by the Northern Tier Pipeline Co. proposal.

Yours sincerely,

Rolfe S. Johnson
Rolfe S. Johnson
Consulting Geologist
6708 60th NE St.
Oak Harbor, Wa. 98277

Registered Professional Engineer P 987
State of California

Copies:
President Carter
Senator W.G. Magnuson
Senator Jackson
Rep. Al Swift
Cecil Andrus

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**155**

Northern Tier Pipeline - EIS        March 31, 1979

155

In reference to the pipeline going across Puget S. I, I object to it for various reasons. It will have a great impact on the invirement, fishing industry and danger operation of the pipe - especially across Saratoga Passage. In late Spring there is a big run off from the mountains + hills + melting of the snow.

I have seen a wall like water coming about 14 to 16 inches high rolling with trees and branches covered with mud and silt + tullies from up river. I have seen dikes collapse - and worked on them.

I have been operating fishing boats + tenders in the local area for about 50 years.

I have even seen big tree stumps with huge rocks on them that were washed out from a logging area. At the present time anyone can look at the installed gas line that was buried across from Strawberry Point to Camano Island. It can be seen at low tide like a big ridge of sand + water rippling over it. This has a big impact on bottom fishing and salmon fishing. I know what I am talking about as I was born + raised here in 1909. Please don't destroy our beauty and invirement.

Hans A. Olsen
2779 N. Strawberry Pt. Rd.
[illegible]

March 31, 1979

Regarding the Northern Tier Draft EIS

In reference to the pipeline going across Puget Sound, I object to it for various reasons. It will have a great impact on the invirement, fishing industry and danger operation of the pipe—especially across Saratoga Passage. In late Spring, there is a big run-off from the mountains and hills and melting of the snow.

I have seen a wall like water coming about 14 to 16 inches high rolling with trees and branches covered with mud and silt and tullies from up river. I have seen dikes collapse. and worked on them.

I have been operating fishing boats and tenders in the local area for about 50 years.

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I know what I am talking about as I was born and raised here in 1909. Please don't destroy our beauty and invironment.

Hans A. Olsen
2779 N. Strawberry Pt. Rd.
Oak Harbor, Wa. 98277

copies to gov. officials

Please note—typewritten for legibility—please enter hand-written copy in the public official record.

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**156**

March 28, 1979

Cecil Andrus
Secretary of the Interior
Dept. of the Interior
Washington, D.C. 20240

Dear Mr. Andrus:

I'm writing to you, on behalf of Island Action Coalition, in the form of an official complaint on the draft EIS for Northern Tier Pipeline proposed secondary alternate route through the Puget Sound waters and Whidbey and Camano Islands.

Northern Tier chose to officially apply for this secondary alternate route just 5 working days before April 2, the closing date for draft EIS comment at the Bureau of Land Management in Portland, Oregon.

There have been no public hearings on the draft EIS proposal in Island County. There have been no informational public meetings. Northern Tier has spoken only to Chamber of Commerce groups. Toner Associates came to speak with a group of citizens of our group, but could not answer the questions we asked. Toner Associates assured us that the Northern Tier representatives would contact us with answers to our questions. We have never heard from them.

The most serious portion of our complaint is that no draft E.I.S on the Northern Tier proposal is available in our county. None has been sent to our planning department in the county courthouse.

We understand 14 pages of the draft E.I.S. is devoted to this secondary alternate route. Although we have not been privileged to read this, we do not believe this is adequate or sufficient to address the sensitive lands of our Island County islands, or the complexities of the floors of Puget Sound, which lie in the Circum Pacific Mobile Belt, a zone of active faulting or earthquakes.

Puget Sound and the chain of Islands contained therein are a national heritage under the protection of the State of Washington. The whole area is one of the richest environments of our nation.

It seems most unethical and unfair to consider a proposal of such magnitude of impact on the environment, with a mere 14 pages in a draft EIS which is not available to the public. The people of this area should have an opportunity to public input in hearings and comment.

1 Island Action Coalition is officially requesting that a new draft EIS with exhaustive studies of our delicate balance of islands and sound be done.

Sincerely,
Harriette Hayes
Harriette Hayes, Chairman
Island Action Coalition
1410 E. Rose Lane
Oak Harbor, Wa. 98277

Copies:
Government representatives
Island County Planning Dept.

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**157**

## Town of Coupeville
Coupeville, Washington

678-4461

Office of the Treas.-Cler
Office of the Mayor
Police Dept.
Planning Dept.

April 2, 1979

Bureau of Land Management
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, OR 97232

RE: Draft E.I.S. for Northern Tier Pipeline Proposal

Gentlemen:

As of this date, the City of Coupeville, Washington has not, repeat not, received any official notification of the proposal or alternate proposals for an oil pipeline in this area. Nor have we been sent a copy of the Draft Environmental Impact Statement prepared by your department for the Northern Tier Project.

Unofficial reports and a fast (60 minute) review of a borrowed copy of that portion of the Draft E.I.S. relating to the alternate route through Whidbey Island revealed an astonishing lack of data concerning earthquake potential, infiltration of ground water supplies, disruption or effects of fish and wildlife, historic sites, the local economy, or the concerns of the citizens in the area.

It is requested that your deadline for comments be extended for 60 days in view of the fact that: 1) the alternate route was chosen at such a late date; 2) copies of your E.I.S. were not distributed to local agencies; and, 3) the Federal government is taking an action with international implications involving our closest neighbor, Canada, and the concerns of everyone from the little Town of Coupeville to the Commonwealth of Canada should be solicited and recognized.

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**CONT**

# Town of Coupeville
Coupeville, Washington

678-4461

Office of the Treas.-Clerk
Office of the Mayor
Police Dept.
Planning Dept.

Bureau of Land Management 2 April 2, 1979

① I trust you will respond favorably to my request for an extension in order that a reasonable evaluation of your Draft E.I.S. may be made. If you refuse to grant the extension, then please enter this letter into the record of the E.I.S. as being the strongest possible protest to any pipeline through Whidbey Island or in the adjacent waters.

Sincerely,

Jack McPherson
Mayor

ENCLOSURE: Copy of Coupeville Council Resolution, re: oil pipeline

Copy to: Mr. Jimmy Carter, President of the United States
Mr. Cecil Andrus, Secretary of the Interior
Senator Warren Magnuson
Senator Henry M. Jackson
Representative Al Swift
State Senator Pat Wanamaker
Representative Sim R. Wilson
Representative Joan Houchen
Island County Board of Commissioners

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# Town of Coupeville
Coupeville, Washington

678-4461

Office of the Treas.-Clerk
Office of the Mayor
Police Dept.
Planning Dept.

## RESOLUTION No. 2-79

## RESOLUTION OPPOSING AN OIL PIPELINE

WHEREAS, serious consideration is being given to construction of an oil pipeline across Whidbey Island and the waters adjacent to Whidbey Island and its surrounding waters and the health and well being of the people of Whidbey Island have not been fully considered in the oil pipeline proposal; and

WHEREAS, the alternatives to an underwater oil pipeline across Puget Sound have not been adequately considered; and

WHEREAS, the decision to construct such a pipeline with a potentially major adverse impact on the waters, islands, and shores of Puget Sound should never be allowed in a free country without due consideration for the people involved; and

WHEREAS, the Island County Board of Commissioners has gone on record as opposing said pipeline; now therefore

BE IT RESOLVED that the Town of Coupeville strongly supports the action of the County Commissioners and opposes the construction of an oil pipeline across Whidbey Island or through the waters of Puget Sound or any other inland waters of this area at this time without a full evaluation of the impact of such construction on the area and its people and without reasonable and firm assurances that the construction and operation of such a pipeline would not result in the long term physical and social degradation of the area and the pollution of the area's natural environment; and

BE IT FURTHER RESOLVED that the people of this community resent the arrogant manner in which the pipeline proposal had been presented and wish to express their indignation at reports that their possible opposition to the proposed pipeline would not be worthy of consideration by the pipeline proponents.

THIS RESOLUTION APPROVED in entirety by the Coupeville Town Council on this day 12th day of March, 1979.

Jack McPherson, Mayor

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For the Official Record

April 1, 1979

Mr. Hoyt
Bureau of Land Management
1750 Lloyd Bldg.
700 NE Multnomah
Portland, Oregon
97232

Dear Mr. Hoyt:

[illegible]

A draft EIS on the Northern Tier Pipeline finally reached me last Friday and I was able to distribute copies over the weekend. I believe the hurried comment period is most unfair and would like to request a 30 day extension period on the draft E.I.S.

On page 8-49 it mentions "The following material is in part adapted from the Northern Tier Pipeline Company." I would like to submit that since the Northern Tier Co. could profit from this proposal, they could be biased in their opinion.

8-49 Climate and Air Quality-since I only have pages 8-49 through 8-57, supplied to me by a friend in Seattle, I could not evaluate the impacts mentioned in section 3.2.1 and 3.2.2. Our visual enjoyment of the beauty of this region extends for miles. Since few places left in our nation have such pure quality of climate and air, it would seem fitting to spend more than just a mere 54 words on the subject.

Noise 8-49.

Again, since I have not seen section 3.2.3, it is difficult to comment on the subject.

Topography / Geology

① "There is no geologic information available for Saratoga Passage which the route would cross from Whidbey to Camano Island." This I find hard to believe, with a USGS office nearby in Seattle and a very adept faculty at the University of Washington Geology Dept. This whole area lies within the Circum Pacific Mobile Belt and is earthquake prone. It is near Mt. Baker, which the past few years has been steaming and has shown volcanic inclinations. No mention is made of the deep gulley in the Saratoga Passage between Camano and Whidbey. No mention is made of the run off of the mountain silt from the rivers into that area. I would like to see more current studies of the faulting in the area. Whidbey received a 4.3 Richter Scale earthquake just a few weeks ago. Partridge Point is a classic example of slopes identified with erosion. I would like more information on the potentially liquefiable soils with no sites identified. Perhaps they are speaking of the Saratoga Passage?

Soils

② "The route across Whidbey Island traverses soils that are mostly well drained, are gravelly and sandy, and —" The proposed route on Jakkema Rd. is not well drained. Some of it lies under water.

③ 8-50 Aquatic Resources Island County is not served by any rivers. With the exception of Oak Harbor, on Whidbey Island, residents are dependent on ground water resources which come from a minimal rain fall and seep into the ground and the aquifiers. A representative from USGS stated at a recent WEC symposium that oil leakage could leak down into those aquafiers and contaminate the water. I understand Spokane was given special consideration because of this identical situation.

④ The description of the impact on fish and shell fish is inadequate. Many people in Island county depend on fishing for a livlihood. There is no mention of the economic impact this would have in Island county. Since many tourists enjoy our salmon fishing, the impact would be felt by the tourist industry, also. Tourism is the most important industry in Island county.

It is my understanding that funding both from state and federal levels has been granted to help with the salmon industy's spawning. This expenditure would be in direct conflict with "Reduced trout populations should recover in several years while salmon may take as long as 20 yrs. to fully recover."

8-51 Physical Components
Because a draft EIS was not available in Island County, there was no time to research the components, however, concerning the Saratoga passage, old-timers say in the spring when the waters carry the silt and logging debris from the mountains as the snow melts, the waters get turbulent with the runoff and move into the passage with a rolling motion, capable of breaking dikes, etc. (see input by Hans Olson, local fisherman).

"Pipeline leaks of up to 3,540 barrels per day could continue undetected until visually noticed." This could play ha voc with the fishing industry.

8-54
"no information is available on oil-spill trajectories for underwater pipeline ruptures on the Whidbey Island Camano Island leg of the submarine pipeline." This is a critical area--a spill could affect the salmon and steelhead because it is the estuary to the Skagit river which is the spawning grounds of these fish. It would have a large impact on the bird life as well, as the skagit river flats are the largest water fowl sanctuary in the United States. "The construction impact on water quality in Skagit Bay and in Saratoga Passage would be particularly severe because of restricted flow and slow flushing in this basin." This is very true. This statement also brings out the magnitude of impact a leak or spill would have in the Saratoga passage.

⑤ The page 8-54 describes the rich natural life that live in the Puget Sound environment. The calamity from oil spills and resultant loss of fish and water fowl life is not described as an economic impact. Many people in the area depend on fishing and crabbing for a living.
8-54 no information is available on trajectories of oil spills for the Whidbey -Camano leg of the submarine pipeline. Since the Skagit river is the spawning grounds for the salmon and since the Whidbey Camano leg of the pipeline would affect their entire life cycle, exhaustive research should be done should be done on this.

Terrestrial Vegetation
With Northern Tier's proposal of no trees or buildings on easements or right of way, there would be a mighty impact with removal of trees along the highways of the islands.

Terrestrial Wildlife
⑥ Section 8.1.1.7 was not available in time for comment. I would like to point out that there are many eagles on Whidbey and Camano and their habitat ranges for many miles. There was no mention of eagles in the DEIS.

Cultural Resources
⑦ p835 Line 4 "Central Whidbey Island historic district" This is a national historic reserve, recently assigned so by our federal government.

Visual Resources
⑧ To remove the trees from the 90 foot area required for the pipeline would scar our islands in many places. We are a rural open space environment in Island County and pipelines and big industry are incompatable with the vistas of beauty we enjoy. The statement on visual resources is inadequate.

Land Use
⑨ "The corridor in Island County would pass through or adjacent to several residential and builtup areas as well as forested and agricultural land." Parts of north and central Whidbey have been classed as potentially critical areas by Washington State D.O.E. The forests serve as watershed for our island. Big industry is inconsistent with our Comprehensive Plan.

Recreation Resources

⑩ Island County is the popular recreation center along with the San Juan Islands, in the state of Washington. 1.6 million people visit Deception Pass Park annually to enjoy our rich environment. Tourism is the projected industry of the island, as stated in the comprehensive plan and in the goals of community development.

Housing
⑪ "On the mainland part of the alternate route only Oak Harbor would experience a large enough influx of nonlocal residents to be adversely affected during the time of construction. Operational phase impacts on housing should be insignificant" not addressed adequately.

In summarize, I feel the magnitude of the environmental impact this project would have on Island County has been most inadequately and insufficiently addressed. There have been no public hearings in Island County and the DEIS was not available in our County Courthouse until 3 day before closing comments. I request a new draft EIS be made.

Harriette Hayes
Harriette Hayes
Chairman, Island Action Coalition
1419 N. Rose Lane
Oak Harbor, Wa.
98277

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COMMENTS ON

DRAFT ENVIRONMENTAL STATEMENT

CRUDE OIL TRANSPORTATION SYSTEM

PORT ANGELES, WASHINGTON TO CLEARBROOK, MINNESOTA

(As proposed by NORTHERN TIER PIPELINE COMPANY)

Harold E. Froehlich
ECO Engineer
March 31, 1979

① I. COMMENTS ON CHAPTER 7

Chapter 7 is entitled "Irreversible and Irretrievable Commitment of Resources"

Transportation of crude oil consumes enormous quantities of energy which in most cases represents an irretrievable commitment of resources. Of all transport modes, pipelines are the least flexible and therefore also entail an irreversible commitment of resources.

Public Law 93-577 1** requires that the consumption of energy shall be analized and considered in evaluating proposals for new commercial development.

There are enormous differences in the resource energy consumption of the various alternatives. Indeed it is important that President Carter have before him the comparitive resource energy consumption for each alternative under consideration. Although helpful, it is insufficient to merely state the yearly electric power requirements and the energy efficiency of the Northern Tier Pipeline only. The Draft Report of the U.S. Department of Energy (hereinafter DOE) contains a section (1.6) in Appendix O entitled "Net Energy Analysis"; but again this analysis has only been done for the Northern Tier Pipeline. No comparison with the alternative supply systems is thus possible. This is a major shortcoming of both the draft EIS and DOE's Draft Supply Alternative Report.

The argument that tariffs reflect the transport energy component is invalid. Tariffs based on capital expenditures for construction in years past cannot be compared with projected tariffs involving new construction. Energy costs are rapidly escalating and vary widely from location to location. In many cases energy waste is rewarded with reduced energy rates based on the larger amount of energy used. The dollar itself is undergoing drastic reduction in value. At 10% inflation, its value will be less than one eighth its current value in twenty years.

Historic and current pipeline movements prove that crude and pipeline ownership[2] has more to do with petroleum movement than tariffs. Indeed the historic ready availability of low cost energy has greatly diminished transport energy consumption cost as a factor in the pipeline tariff.

The intent of the Law is clearly to appraise the consumption of energy resources in energy units for the various alternatives. The British Thermal Unit (BTU) parameter, as utilized by DOE in the case of Northern Tier Pipeline, is reasonable. A BTU today will still be a BTU forty to fifty years from now.

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**CONT**

There are but a finite number of these non-renewable energy units available to us.[3] The very survival of the United States as a nation depends in large part on how well we manage the use of the earth's remaining non-renewable energy resources.

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** For superscrips, please refer to reference page

① We have entered an era of energy supply shortages and are becoming increasingly[4] vulnerable to energy supply interruptions, particularly from foreign suppliers. Each day we are importing over eight million barrels of oil. This is about 40% of our total oil consumption.

We can no longer afford the luxury of assuming, as we have in the past, that energy will be available to operate any system we select. In fact, the system we select must be energy efficient in its operation. If it is not, this in itself is a good reason for its rejection.

No longer can dollars alone control our business cycle or events in supply countries. There are already a half trillion dollars sloshing around outside the United States and there is a concerted worldwide effort to convert these dollars into assets considered to be more stable. Few, if any, countries are going to increase the supply simply to get more dollars.

No modern industrial country can grow and prosper without adequate supplies of energy. One need only glance at the 1974-75 growth rate to see that an energy supply interruption brings the U.S. economy to a halt.[5] In the northern tier states, a lack of fuel literally means that some of us will freeze in our homes.

The economic theory that major downturns originate from the demand side —as taught by John Maynard Keynes—is no longer valid.[6] Indiscrete use, waste, or cutoff of our energy sources can be far more devastating. An inefficient resolution of the northern tier crude supply problem simply cannot be tolerated.

The Canadian National Energy Board foresaw the problem in 1972. They have wisely embarked upon a course of energy independence.[7] In 1974, they published their proposed method of setting exports. In 1978, they agreed to export at 1978 levels for three more years,[8] specifically to give us time to build alternate crude oil transportation means. Now it is 1979 and we have not yet done our homework with respect to which alternative will cost us the least in terms of non-renewable energy resource consumption. How can we expect President Carter to make an intelligent decision unless these fundamental facts are put before him? Neither DOE's Draft Report or the Draft EIS contains this vital comparative information.

This need not be a long drawn out study. Most of the information is already available. It only requires an individual to put it into proper format. This can be done in a month or less.

The comparative basic efficiency of various pipelines in utilizing our energy resources can be made by having knowledge of three factors. These factors are: 1. the pipe size, 2. the quantity of crude oil being forced through the pipe, and 3. information regarding the percentage of renewable energy resources the pipe utilizes. This is possible because the lines are very long and the power to overcome friction at the interface between the oil and interior pipe surface is by far the predominant energy consumer. Losses for bends, irregularities, additional turbulence at pump stations, the effects of wall thickness are additional losses which would be additive to the basic pipe friction loss. Pipeline engineers usually express these as a percentage of the pipe friction; therefore, for comparative purposes these additional losses can be ignored as they would cancel out in the comparison. Note that line length is not in this comparison. It is brought in later, as will be shown, to compare one route with another.

The procedure involves the calculation of the velocity from which a Reynolds number and friction factor are obtained. This then permits the calculation of the energy required per foot of pipeline. Enclosed is a paper which provides the information necessary to make these calculations. In figure 1 is plotted the ratio of energy being transported to the friction energy loss for various pipelines. Although pipelines will transport oils of varying gravities and viscosities, the figure is based on the same oil for all lines. From this one can draw conclusions on how well the proposer has selected the pipe size, the quantitiy of oil he intends to pump through it, and the location of the pipeline in terms of consumption of our energy resources. It is thus easy to grasp the fact that the Northern Tier Pipeline has fundamental advantages over any of the mid-continent pipelines.

The length of the line will now be brought into the picture to permit the energy consumption comparison in delivering crude oil to a specific state. DOE has stated that Minnesota will experience the largest shortfall of any state. It will therefore be utilized to show the advantage of the Northern Tier Pipeline in conserving our energy resources as compared to a southern route consisting of Capline, Capwood, and Northern. Although Koch proposes to barge extremely heavy crude to Wood River, Illinois and blend it down to a viscosity of 500 SUS for pumping through Northern, a lighter crude of 200 SUS will be used for both lines to permit a direct comparison.

The following distances are applied to the various pipelines:

| | |
|---|---|
| Capline | 632 miles |
| Capwood | 55 " |
| Northern | 476 " |
| | 1163 miles |

Northern Tier 1541 miles

FOR 240000 BPD
The southern route consumes 4.8 times more energy resources than the Northern Tier route even though the distance is 33% longer for Northern Tier. It should be noted that Capline originates at St. James, Louisiana which is some distance up the Mississippi and shortens the southern route somewhat.

A similar analysis will also show that even delivery to Chicago, Illinois by Northern Tier and Lakehead is less consumptive of energy than Capline and Chicap by a wide margin.

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①

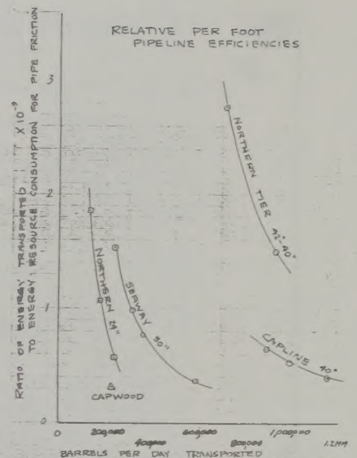


FIGURE 1

② II. COMMENTS ON CHAPTER 8

Chapter 8 is entitled "Alternatives to the Proposed Action"

One of the proposed alternatives to the Northern Tier Pipeline is called: Transport by Tanker and Mid-Continent Pipelines. This alternative is discussed in section 8.4.3.7 on pages 8-110 through 8-114.

The Mid-Continent Pipeline system as shown in Figure 8.4.3.7-1 is powered by electricity generated almost entirely by the combustion of fossil fuels in stationary power plants.[9] These plants are major sources of particulate matter, sulfur oxides, and nitrogen oxides to pollute the atmosphere.[10]

The most common sulfur oxide from combustion is sulfur dioxide ($SO_2$). Sulfur dioxide in the atmosphere converts to sulfates which can damage the lungs, and to sulfurous or sulfuric acid, which increases the acidity of rainfall.

Sulfur oxide emission is heavy in areas from the Mississippi River valley eastward. Prevailing wind conditions tend to carry some of these emissions and their transformation products into the populous urban areas of the Northeast. The resulting regional impact is shown graphically in Figure 2. The increase between 1956 and 1973 is illustrated by the growth in the area having a rainfall pH of 4.52 or less as shown in Figure 3. Both of these figures are reproduced from reference 10.

Acid rains may damage vegetation, alter soil conditions, effect animals, and kill fish. The presence of sulfur oxides increases bronchio constriction, aggravates asthma and emphysema, and decreases lung ventilation.

There are also many areas in this same general region which have sulfate pollution above threshold concentrations. Nitrogen oxide and particulate concentration are factors in the formation of sulfates. Sulfates increase the daily mortality, aggravate heart and lung disease in the elderly, aggravate asthma, increase acute respiratory diseases in children and increase the risk of chronic bronchitis.

Electricity to power these mid-continent pipelines must ultimately come from coal or nuclear. Since there is no currently proven nuclear disposal technique perfected, increased fossil fuel combustion will be required. Although the Midwest Region has an estimated sixty-two billion tons of recoverable coal reserves, less than 2% of it meets EPA $SO_2$ standards as mined and less than 5% of it is physically cleanable to meet these standards. The most promising sulfur control technology is flue gas desulfurization. Capital costs for this equipment is high and there is an energy penalty ranging from 3 to 8 percent.[11] EPA estimates the total capital investment to control energy-related pollution at twenty-five billion dollars by 1985.

A.D. Little has clearly indicated that there is insufficient investment capital available to meet this requirement.[12] Therefore, it is likely that the pollution standards will not be met and increased use of the mid-continent pipeline system will therefore increase the suffering for many people.

CONT

TABLE 1

PREDOMINANT LOCAL ENERGY SOURCE FOR VARIOUS PIPELINES

MID CONTINENT REGION

| PIPELINE OR ROUTE | STATE | ENERGY SOURCE |
|---|---|---|
| Capline | Louisiana<br>Mississippi<br>Tennessee<br>Kentucky<br>Illinois | Gas, some oil<br>Oil<br>High sulfur coal<br>High sulfur coal<br>High sulfur coal |
| Texoma<br>Explorer<br>Seaway | Texas<br>Oklahoma | Gas<br>Gas |
| Amoco<br>Arco<br>Texaco-Cities Service<br>Ozark<br>Explorer | Oklahoma<br>Kansas<br>Missouri<br>Illinois | Gas<br>High sulfur coal<br>High sulfur coal<br>High sulfur coal |
| Capwood<br>Woodpat<br>Chicap | Illinois | High sulfur coal |
| Northern | Illinois<br>Iowa<br>Minnesota | High sulfur coal<br>High sulfur coal<br>Imported coal |
| Barging up Mississippi | Various | Oil |

NORTHERN TIER REGION

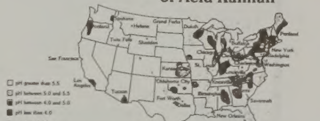
| PIPELINE OR ROUTE | STATE | ENERGY SOURCE |
|---|---|---|
| Northern Tier Pipeline | Washington<br>Idaho<br>Montana<br>North Dakota<br>Minnesota | Hydropower<br>Hydropower<br>Hydropower<br>Low and medium sulfur coal<br>Imported coal |

# Acid Rainfall

## A Problem in the East

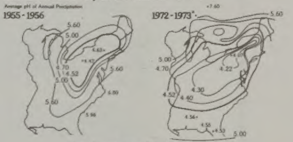
Burning of fossil fuels has increased the concentration of sulfur dioxide and sulfates in the atmosphere. These pollutants contribute to the acidity of rainfall that degrades health and water quality, affects specific life forms and damages property. Studies are currently being conducted on the atmospheric effects of relatively long-range movement of pollutant emissions from the midwest and Great Lakes region to the northeast or into Canada. Acid rains harm crops, fish, and timber, and also damage building materials, outside stone and concrete work, and some metallic equipment.

## Regional Impact of Acid Rainfall

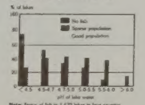


Source: Adapted from U. S. Congress, 1977

### Acidity of Precipitation has Increased Markedly in the Eastern U. S. . . .



### Fish Population Declines as the Acidity of Lake Water Increases



Note: Status of fish in 1,679 lakes in four counties in southwestern Norway.

CONT

Another aspect of Midwest coal reserves is the small average thickness (5.5 ft) and the large area of highly productive farm acreage that is disturbed to mine it, 104 acres per million tons. Likewise waste disposal poses a similar land use problem.

The mid-continent pipeline system, in certain areas, involves an environmental problem of great magnitude and more insidious than an ocean tanker spill. Koch's Northern line from Illinois to Minnesota will lie within four inches of an estimated 10,000 farm tile drainage lines. A considerable portion of this line lies directly over one of the world's finest fresh water aquifers.

The insidious nature of this project is that an undetected leak of several thousand gallons a day can leak unknowingly into the tile network for months on end. Some of the tile systems run for miles before surfacing. In winter, the frozen topsoil keeps the oil from surfacing and, if and when it does surface in a drainage ditch, it is not likely to be spotted until spring because the oil stays below the snow. Metering systems cannot detect these relatively low level leaks and flyovers are a waste of time under these circumstances.

In open water, an oil leak will immediately surface and the chances of spotting it are good. It is a different situation underground, with buried drainage conduits.

Aquifers are recharged from surface water percolating through the soil and it is known that water will carry oil along with it.[13] The potential for wide spread soil and aquifer contamination would be ever present. Numerous drinking wells are already shutdown due to contamination. Constructing a pipeline through tiled fields which in turn lie over a huge fresh water aquifer is environmental engineering at its worst. Common sense would indicate that such a project should never be allowed to go forward.

There are no known tiled areas traversed by the Northern Tier Pipeline. As explained in the ES, the line was routed to avoid an aquifer in the Spokane area.

Koch has refused to see this as a problem. The resolution of it therefore is very much in doubt.

III. CONCLUDING REMARKS

It is essential that the federal government act quickly to select and approve a northern west to east pipeline. Otherwise, the tanker mid-content pipeline system will become a reality by default rather than by wise choice. ANS crude is already being routinely used in Minnesota refineries. It arrives here via the Panama Canal and mid-continent pipelines at tremendous cost in energy resource consumption, but interestingly at a competitive tariff.

Koch Refining Company is agressively promoting their Wood River, Illinois to Minnesota pipeline to capture expanded markets in northern Minnesota, Wisconsin, and Michigan. Koch has even proposed to use their southern line to transport crude back to Billings, Montana via reversed Minnesota and Portal pipelines and a new pipeline segment in Montana.

Another scheme reported to be favored by the Department of Energy is to ship our Alaskan crude to Japan in exchange for Mexican crude delivered to our Gulf Coast. This scheme wastes enough energy to heat over half the homes in the entire state of Minnesota.

Sohio has recently indicated that the economics of their line is becoming marginal. Inflation and the availability of Mexican crude in the Gulf are logical reasons for this conclusion; especially, since DOE does not forecast a shortfall for the Gulf region.

Congress has mandated the administration to do comprehensive planning to achieve secure energy supply systems for the mid-term of 1980 to 2000 and for the longer term beyong the year 2000. Relief from the Nation's suffering from a shortage of environmentally acceptable forms of energy shall be addressed.

As with many technical problems, the difficulty sometimes turns out to be an opportunity. In part, there is such an opportunity for the United States as a whole in the resolution of West Coast surplus and the northern tier shortfall. DOE has done a supply demand balance for each state in the northern tier. They have documented that the shortfall, due to transportation limitations alone, is less than the total quantity the Northern Tier Pipeline backers believe would make the project financially viable. DOE has also stated that certain crude can be delivered to the northern tier refineries via a northern tier pipeline at competitive tariffs. Amoco, after expending $500,000 in study, concluded that a northern tier line provides the lowest cost method of delivering Alaskan, Indonesian, and Persian Gulf crudes.

A northern tier line thus has the potential to remove some of the load from the already overloaded mid-continent pipeline system. The Northern Tier Pipeline can serve sixty-six refineries in eighteen states. A 10% reduction in throughput of currently used mid-continent pipelines will result in approximately a 30% reduction in fossil fuel combustion. This is perhaps the most logical way to clean the air somewhat for the people in and east of the Mississippi River Valley, and save a significant amount of energy in the process!!

Congress places heavy emphasis on the use of domestic energy resources, systems which utilize renewable energy types and efficient projects including energy transportation. As shown in section I, the Northern Tier Pipeline fullfills all these requirements and is the most secure supply system.

The duty of the administration shall be to review, formulate, utilize funds, establish procedures and initiate programs to further these objectives. Expenditures of twenty billion dollars in the next ten years are anticipated. The committment to these objectives shall be similar to the Manhattan Project of World War II and the Apollo Space program. A northern tier pipeline to directly serve oil deficient states and displace inefficient transport modes is as important as these programs were.

Clearly Congress has given the administration a well defined objective and the resources to carry it out. Part of the effort should be directed to remove the doubts in the minds of industry executives, particularly Amoco, that government can and will grant permits on a timely basis to construct a northern tier pipeline.

Congress has further directed that the private sector should be utilized. The Northern Tier Pipeline proposal is entirely a private endeavor and therefore should be strongly encouraged by the administration.

REFERENCES

1. Draft Report--Volume 2 (of 2). Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000, Appendices. U.S. Department of Energy, Assistant Secretary for Policy and Evaluation, Office of Policy Analysis, February 21, 1979, pg 0-25.

2. Oil and Gas Journal, October 23, 1978, pg 53.

3. The U.S. Energy Problem--America's Achilles' Heel, Dr. John J. McKetta, Pennsylvania State University, March 21, 1978.

4. Oil and Gas Journal, March 26, 1979, pg 58.

5. U.S. Energy Supply/Demand Considerations 1978 to 2000, Tenneco, March 1, 1978, copy of page 5 included in Appendix.

6. Northliner, Dr. Paul Erdman, March, 1979, pg 16.

7. Canadian Oil, Supply & Requirements, National Energy Board, February, 1977.

8. Canadian Oil, Supply and Requirements, National Energy Board, September, 1978.

CONT

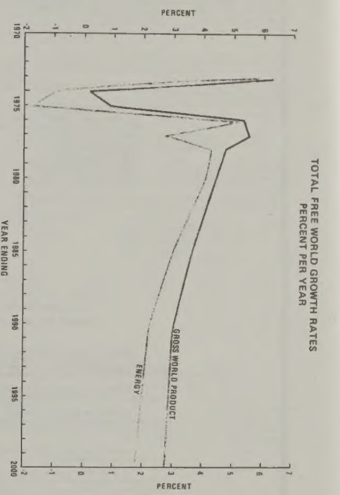
9. National Energy Transportation, Volume 1--Current Systems and Movements, United States Senate Committee on Energy and Natural Resources, May 1977, Publication No. 95-15, copy of page 151 included in Appendix.

10. Energy/Environment Fact Book, U.S. Department of Energy, Asst Secretary for Policy and Evaluation, U.S. Environmental Protection Agency, Research and Development Energy, Minerals and Industry, March 1978.

11. Ibid, pg 43.

12. Outlook for Air and Water Pollution Control through 1985, Arthur D. Little, Inc, April, 1977.

13. Oil Spill: Decisions for Debris Disposal, Industrial Environmental Research Laboratory, Edison, New Jersey, October, 1977.



TOTAL FREE WORLD GROWTH RATES
PERCENT PER YEAR

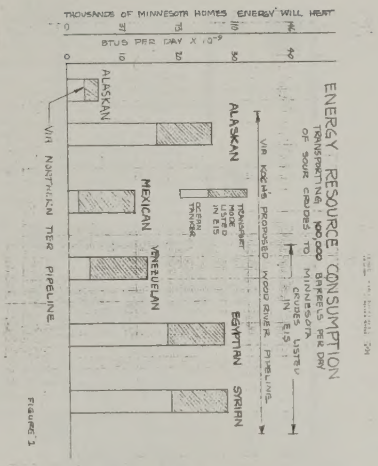


FIGURE 1

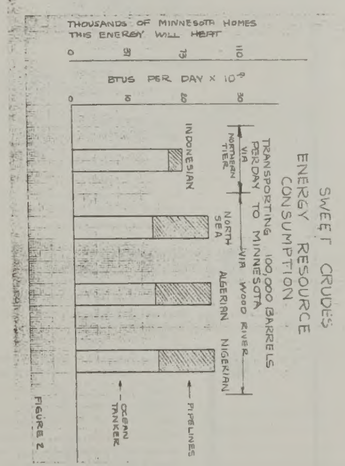


FIGURE 2

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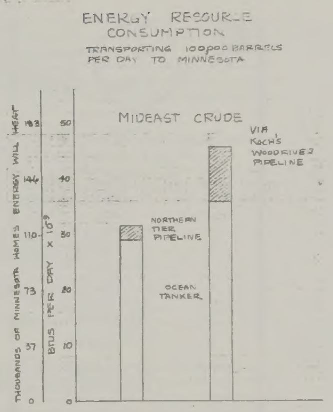

## ENERGY RESOURCE CONSUMPTION TO BRING CRUDE OIL TO MINNESOTA

Steven C. Froehlich
Physics 152
February 28, 1979

## ENERGY RESOURCE CONSUMPTION TO BRING CRUDE OIL TO MINNESOTA

Due to the curtailment of Canadian crude oil flowing into the state of Minnesota, there is a need to find the best route to bring crude oil to the state. There are two general routes that could be taken:

1. Build a tanker port at Port Angeles, Washington and from there a pipeline would be built to Clearbrook, Minnesota. From Clearbrook, the oil would be shipped through the existing Minnesota Pipeline to the Twin Cities. This is the Northern Tier Pipeline route.
2. The second alternative is to ship to a number of ports in Texas and Louisiana. From here the oil would be piped in either the Seaway-Ozark, Explorer, or the Capline-Capwood pipelines to Wood River, Ill. The oil also could be barged up the Mississippi River to Wood River. From Wood River, a pipeline would be built to bring crude oil to the Twin Cities. This would be called the Northern Pipeline.

This report deals with the Energy Resource Consumption to transport crude oil to Minnesota from states that border on the ocean via the Northern Tier Pipeline versus the southern route through the Northern Pipeline. This is an excellent example of the use of Poiseuille's law modified to take into account turbulent flow.

There are two distinct and entirely different types of flow: viscous or laminar flow and turbulent flow. The Reynolds number is the criterion whether flow is laminar or turbulent. At the so-called "critical value" of the Reynolds number, flow changes from laminar to turbulent. An example of laminar flow is smoke rising from a cigarette. When the smoke is rising in a smooth column, the flow is laminar. When the smoke breaks up, flow is turbulent.

It has been found that there is no sudden transition from laminar to turbulent flow, but a gradual change beginning with slight initial disturbances and passing through a transitional range until complete turbulence exists. The value of the critical Reynolds number below which laminar flow is certain to exist has been found as 2000.

In the pipeline problem, the first step is the calculation of the Reynolds number. From the *Environmental Impact Statement*[1], the following quantities of crude oil on the southern route will be shipped to Wood River, Illinois via the following routes:

| ROUTE | BARRELS/DAY (BPD) |
|---|---|
| Seaway and Ozark Pipeline | 70,000 |
| Capline and Capwood Pipeline | 40,000 |
| Explorer Pipeline | 15,000 |
| Barge up Mississippi (1091.6 miles) | 50,000 |

| PIPELINE | Size (Dia. Inches) | Length (Miles) | Flow Rate (BPD) |
|---|---|---|---|
| Seaway Pipeline | 30 | 492 | 320,000 |
| Ozark Pipeline | 22 | 422 | 200,000 |
| Explorer to Tulsa | 28 | 462 | 295,000 |
| Explorer to Wood River | 24 | 374 | 225,000 |
| Capline Pipeline | 40 | 632 | 1,120,000 |
| Capwood Pipeline | 20 | 55 | 230,000 |
| From Wood River to Minnesota | | | |
| Northern Pipeline | 24 | 476 | 175,000 |

For purposes of calculating the energy resource consumption, the same type of crude oil will be assumed to be transported by both the northern and southern routes. Crude with a 200 Saybolt Universal Seconds (sus) viscosity and a specific gravity of .913 will be assumed. The formula[2] for the Reynolds number ($R_R$) is $R_R = \frac{\rho v D}{\eta}$ where $\rho$ is the mass density of the fluid, v the average forward velocity, $\eta$ the viscosity, and D the diameter of the pipe.

The formula[3] for converting the kinematic viscosity ($\nu$) from (sus) units to English units is:

$\nu = k\left[(a)(\text{sus}) - \frac{b}{\text{sus}}\right]$ where k, a, b are constants with the following values: $k = 10.76 \times 10^{-4}$, $a = .00220$, $b = 1.35$.

$$= 10.76 \times 10^{-4}\left((.00220)(200) - \frac{1.35}{200}\right)$$

$$= .000466\ \text{ft}^2/\text{sec}.$$

The kinematic viscosity is equal to the absolute viscosity ( $\eta$ ) divided by the density ( $\rho$ ), thus the formula for the Reynolds number can be rewritten as $R_R = \frac{vD}{\nu}$. Now we need to find the velocity of flow in each pipeline.

The barrels per day are converted to cubic feet per second (Q) as follows:

$$Q = \frac{(\text{BPD})(42\ \text{gals/barrel})(231\ \text{in}^3/\text{gal})}{(24\ \text{hrs/day})(3600\ \text{sec/hr})(1728\ \text{in}^3/\text{ft}^3)}$$

$$= .000065\ \text{ft}^3/\text{sec} \times \text{BPD}$$

The velocity is found by dividing Q by the cross sectional area (A) of the pipe.

The Reynolds number for the Seaway Pipeline is:

$$R_R = \frac{vD}{\nu} \qquad A = \frac{\pi D^2}{4} \qquad v = \frac{Q}{A}$$

$$= 22{,}727 \qquad = 4.91\ \text{ft}^2 \qquad = 4.24\ \text{ft/sec}$$

Similarly the Reynolds numbers are calculated for the other pipelines:

| | |
|---|---|
| Ozark Pipeline | 19,374 |
| Explorer to Tulsa | 22,453 |
| Explorer to Wood River | 19,980 |
| Capline Pipeline | 59,673 |
| Capwood Pipeline | 24,508 |
| Northern Pipeline | 15,540 |

The next step is to rewrite the formula[4] for Poiseuille's law to include the friction factor (f) for laminar flow. Poiseuille's Law: $Q = \frac{\pi R^4}{8\eta}\,\frac{p_1 - p_2}{L}$ where $R = \frac{D}{2}$, $Q = vA = v\frac{\pi D^2}{4}$, L = length of pipe, and p = pressure.

This can be rewritten as:

$$\frac{v\pi D^2}{4} = \left(\frac{\pi D^4}{(8)(16)(\eta)}\right)\left(\frac{p_1 - p_2}{L}\right)$$

$$p_1 - p_2 = \frac{32\eta L v}{D^2}$$

Darcy developed a corresponding formula[5] for turbulent flow:

$$p_1 - p_2 = f\left(\frac{L}{D}\right)\frac{v^2\delta}{2g}$$

where g equals the acceleration due to gravity and $\delta = \rho g$. To show the likeness between the two equations, we must multiply the Poiseuille's equation by: $\frac{2vg\delta}{2vg\delta}$

$$p_1 - p_2 = \left(\frac{32\eta L v}{D^2}\right)\left(\frac{2vg\delta}{2vg\delta}\right)$$

$$= \left(\frac{64\eta}{\rho g D v}\right)\left(\frac{L}{D}\right)\left(\frac{v^2\delta}{2g}\right)$$

$$= \left(\frac{64\eta}{\rho D v}\right)\left(\frac{L}{D}\right)\left(\frac{v^2\delta}{2g}\right)$$

The quantity $\frac{64\eta}{\rho D v}$ is equal to $\frac{64}{R_R}$ and is called the friction factor (f) for laminar flow.

$$p_1 - p_2 = f\left(\frac{L}{D}\right)\left(\frac{v^2\delta}{2g}\right)$$

The friction factor is plotted on the attached graph for both laminar and turbulent flow versus the Reynolds number. Since this number is above 10,000 for pipelines, the turbulent flow curve will have to be used to obtain the friction factor and to compute the pressure loss and energy consumption.

The next step is deriving a formula[6] for the power (P). P = F (force on pipe) x v.

$$F = (p_1 - p_2)\,\frac{\pi D^2}{4}$$

$$P = f\left(\frac{L}{D}\right)\left(\frac{v^2\delta}{2g}\right)\left(\frac{\pi D^2}{4}\right)v \quad \text{ft lbs/sec}$$

Simplifying we get:

$$P = \left(\frac{\delta\pi}{8g}\right) f D v^3 L \qquad \delta_{H_2O} = 62.4\ \text{lbs/ft}^3$$

$$= .695\, f D v^3 L \qquad \delta_{\text{oil}} = (62.4)(.913) = 56.97$$

$$g = 32.2$$

All of the southern pipelines are powered by electricity that is generated by some form of heat. These power plants are approximately 25% efficient when you take into account the inefficiencies in the power plant, transmission and the energy the power plant uses for lights, burners, conveyors, fuel transportation, stack scrubbers, etc. In addition the pipeline pumps plus the motors will be assumed to run at 75% efficiency[7]. Thus the power equation converted to energy resource consumption in terms of heat loss for a 24 hour day with 1 BTU equal to 778 foot pounds of work becomes:

$$\text{BTU/day} = \frac{4(24)(3600)(.695)}{(778)(.75)}\, f D v^3 L$$

$$= 411.6\, f D v^3 L$$

Thus the energy consumption can be calculated. For the Seaway Pipeline:

$$\text{BTU/day} = (411.6)(.0248)(2.5)(4.24)^3(492)(5280)$$

$$= 5.053 \times 10^9$$

But only 70,000 of the 320,000 barrels of oil will actually reach Minnesota.

$$\frac{70{,}000}{320{,}000} \times 5.053 \times 10^9 = 1.105 \times 10^9\ \text{BTU/day}$$

Similarly the energy consumption is figured for the other pipelines:

| | |
|---|---|
| Seaway Pipeline | $1.105 \times 10^9$ BTU/day |
| Ozark | $1.827 \times 10^9$ BTU/day |
| Explorer to Tulsa | $.286 \times 10^9$ BTU/day |
| Explorer to Wood River | $.282 \times 10^9$ BTU/day |
| Capline | $1.879 \times 10^9$ BTU/day |
| Capwood | $.279 \times 10^9$ BTU/day |
| Northern | $2.583 \times 10^9$ BTU/day |

The energy consumption for the portion of crude oil which is barged up the Mississippi to Wood River is calculated by using a BTU value per ton mile of 780.[8]

$$\frac{(50{,}000\ \text{BPD})(42\ \text{gals/bbl})(231\ \text{in}^3/\text{gal})(62.4\,(.913))\ \text{lbs/ft}^3)}{(1728\ \text{in}^3/\text{ft}^3)(2000\ \text{lbs/ton})} = 7997\ \text{tons/day}$$

$$(780)(7997)(1091.6) = 6.809 \times 10^9\ \text{BTU/day}$$

The total resource energy consumption to transport 175,000 BPD of crude to Minnesota via the southern route is: $8.241 \times 10^9$ BTU/day.

The states of Washington and Montana produce considerable quantities of hydropower[9] which is a renewable resource. About half of the energy used on the northern route will come from hydro power so this cannot be figured into the energy consumption formula. Otherwise the formula is identical to the one developed for the southern route.

$$\frac{\text{BTU}}{\text{day}} = \left(\tfrac{1}{2}\right)\frac{(4)(24)(3600)(.695)}{(778)(.75)}\, f D v^3 L$$

$$= 205.8\, f D v^3 L$$

| | Pipe size (in) | Length(miles) | BPD |
|---|---|---|---|
| Port Angeles to Glacier | 42 | 860 | 709,000 |
| Glacier to Butte | 40 | 245 | 614,000 |
| Butte to Mandan | 40 | 179 | 564,000 |
| Mandan to Clearbrook | 40 | 257 | 554,000 |

| | $R_R$ | BTU/day |
|---|---|---|
| Port Angeles to Glacier | 35,976 | $1.970 \times 10^9$ |
| Glacier to Butte | 32,714 | $.556 \times 10^9$ |
| Butte to Mandan | 30,050 | $.348 \times 10^9$ |
| Mandan to Clearbrook | 29,517 | $.490 \times 10^9$ |

The total resource energy consumption to transport 175,000 BPD of crude oil to Minnesota via the northern route is: $3.364 \times 10^9$ BTU/day compared with $8.241 \times 10^9$ for the southern routes. Thus it can be seen that it takes 2½ times more resource energy consumption to bring crude oil to Minnesota from the south than from the north.

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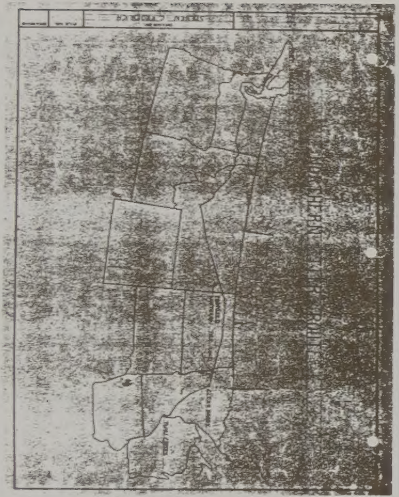

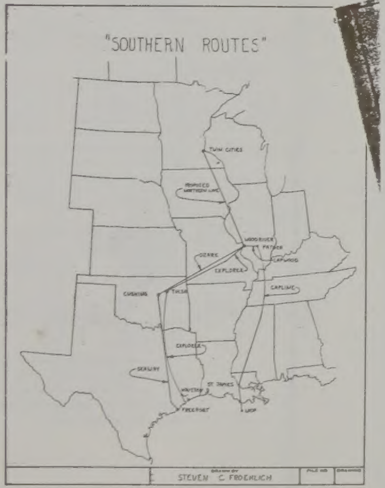

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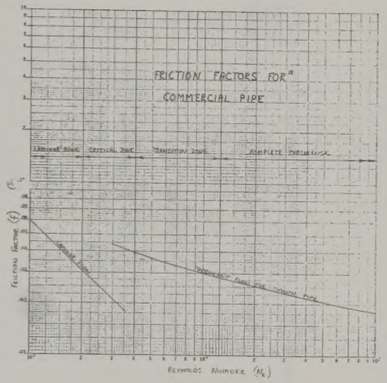

FOOTNOTES

[1] Minnesota Department of Natural Resources, Final Environmental Impact Statement Volume I. Minnesota Portion of a Crude Oil Pipeline From Wood River, Illinois to Pine Bend, Minnesota.

[2] Francis W. Sears, Mark W. Zemansky, Hugh D. Young, College Physics Fourth Edition Complete, (Reading, Massachusetts: Addison-Wesley, 1974), p. 226 (13-21).

[3] Walter Ernst, Oil Hydraulic Power and Its Industrial Applications Second Edition, (New York: McGraw-Hill, 1960), p. 13 (2.0)

[4] Sears, p. 224, (13-18).

[5] Ernst, p. 56, (6.2).

[6] Sears, p. 120, (7-17).

[7] James R. Waller, Jr., letter to Mr. Ron Visness, Minnesota Energy Agency Dec. 21, 1978.

[8] Douglas M. Considine, Energy Technology Handbook (New York: McGraw-Hill, 1977).

[9] Henry M. Jackson, Chairman, Committee on Energy and Natural Resources and Warren G. Magnuson, Chairman, Committee on Commerce, Science, and Transportation, Report on National Energy Transportation vol. I—Current Systems and Movements, map no. 14.

[10] Northern Tier Pipeline Company Application to Minnesota Energy Agency for Certificate of Need to Construct a 40-inch Pipeline, (June 30, 1978). General Route Map Northern Tier Pipeline System, Figure 31-1.

[11] Pipeline routing map submitted by Koch Refinery to Minnesota Hearing Examiner.

[12] Crane Engineering Division, Flow of Fluids Through Valves, Fittings, and Pipe, (1969), "Friction Factors for Any Type of Commercial Pipe" chart, Appendix A-24.

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Jackson, Henry M., Chairman, Committee on Energy and Natural Resources and Magnuson, Warren G., Chairman, Committee on Commerce, Science, and Transportation. Report on National Energy Transportation. Vol. I.

Minnesota Department of Natural Resources. Final Environmental Impact Statement, Volume I. Minnesota Portion of a Crude Oil Pipeline From Wood River, Illinois to Pine Bend, Minnesota.

Northern Tier Pipeline Company application to Minnesota Energy Agency for Certificate of Need to Construct a 40-inch Pipeline. June 30, 1978.

Pipeline routing map submitted by Koch Refinery to Minnesota Hearing Examiner.

Sears, Francis W., Zemansky, Mark W., Young, Hugh D. College Physics. Fourth Edition. Reading, Massachusetts: Addison-Wesley, 1974.

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GRANT – LINCOLN – ADAMS COUNTY
CONFERENCE OF GOVERNMENTS
138 First Avenue N.W.
Ephrata, Washington 98823
509/754-2011 Ext. 389

March 30, 1979

TO: Bureau of Land Management, Northern Tier Pipeline, Environmental Statement Team

FROM: Doug Miller, DM. Research Consultant, Grant-Lincoln-Adams County Conference of Governments

RE: Grant County Review and Comment on the Draft Environmental Statement Crude Oil Transportation System

Enclosed are Grant County's comments on the Environmental Statement prepared by BLM for the proposed Northern Tier Pipeline Project. The comments are divided into two separate documents. The first is a summary of oral comments made by myself at the BLM public hearing held in Ephrata, March 12, 1979. The second document describes general and specific comments on a chapter by chapter basis.

Also enclosed is a prioritized list of problem statements taken from Grant County's Northern Tier Pipeline Energy Impact Analysis. The analysis details potential problems and concerns that have been identified if the proposed pipeline crosses Grant County.

If any further information is needed, we'd be happy to help in any way we can.

cc: Jim Williams (WACO)

SUMMARY OF ORAL COMMENTS ON BEHALF OF GRANT COUNTY MADE BY DOUG MILLER, ENERGY IMPACT ANALYSIS CONSULTANT, GRANT, LINCOLN COUNTY CONFERENCE OF GOVERNMENTS, AT THE B.L.M. PUBLIC HEARING IN EPHRATA ON MARCH 12,1979

First of all, this Draft Environmental Statement does fit the criteria of an Environmental Statement (ES). It describes the pipeline project and outlines potential impacts and possible mitigating measures to reduce the impacts. But I'm afraid, at the county level the ES falls far short as a usable document. Following is a summary of reasons we feel the ES is inadequate.

The ES is much too general to provide the identification of local and county impacts and mitigation necessary for area officials to deal with the project and it's impacts. Too often the ES describes an impact with a statement like, "Impacts from sediment in the rivers will vary from extreme to minimal." This does little to help Grant County identify possible sediment impacts on its water bodies crossed by the pipeline.

Few site specific observations are documented on the ES. It's obvious that no on site inspections were done in Grant County. It appears that data was either gathered from a few other agencies or from aerial photographs.

Another reason the ES does not meet the county's needs is the proliferation of mistakes throughout the document. In the 50 miles of Grant County, numberous mistakes were found in the draft (see specific comments on individual chapters.) With this many mistakes identified in 50 miles of pipeline, we wonder how many mistakes exist for the other 1507 miles of pipeline and port facilities at Port Angeles.

In many instances, references made in the ES are incomplete, outdated, or contain discrepancies. A reference to the 1978 Pace Study does not relate, in some instances, to our copy of the same study. Much of the data used in the ES was taken from NTPC application to B.L.M., dated February, ① 1978. Unfortunately, that information, at least for Washington State, was updated by NTPC in it's Application for Site Certification to the Washington State Energy Facility Site Evaluation Council (EFSEC) in August, 1978. Much of this updated material is pertinent to the ES and should be included.

② Overall the ES does an "adequate" job of defining first order impacts but second and third order impacts are not

CONT

② dealt with. Example: Oil spilled into the West Canal near Ephrata, would have a first order impact on farms and irrigated agricultural land in the Quincy Valley. A second order impact would occur in the economics of the area, such as Agribusiness related activities in the surrounding communities. A third order impact might be a large turnover in farm propoerty brought on by some farmers not being able to grow products for up to five years due to oil contamination. It's critical in a project of this size that we understand the true magnitude of our actions.

③ On the first page of the ES it's stated that the document is covering a "two mile study area". Due to the nature of the proposal we must assume that the pipeline could go through any part of that two-mile area. Yet the ES is inconsistent in this regard. Sometimes, as in the soil survey, the ES does study the entire corridor, but in other places it assumes the corridor centerline as the route.

In conclusion, the basic problem with the ES is that it trys to accomplish too much with too little. Perhaps a different format could be used to get closer to the real issues and impacts at the local level. If we are going to use the Environmental Statement process, then it should be done correctly, or it's of no use.

We at the county level recognize the problems involved with a task as large and as complicated as this. But we also want you (BLM) to recognize and document our problems... the people, cities, and counties that must live with this project.

NORTHERN TIER PIPELINE
BUREAU OF LAND MANAGEMENT
DRAFT ENVIRONMENTAL STATEMENT
REVIEW AND COMMENT - PAGE 1

DESCRIPTION OF THE PROPOSED ACTION

CHAPTER 1

General Comments

Generally this section is an adequate description of the oil pipeline project as it relates to Grant County. However, the document contains many minor errors, omissions, and generalities regarding the route through this county (see specifics below). The number of errors encountered in just the 50 miles of Grant County makes the legitimacy of the entire document suspect.

This section attempts to accomplish too much in too little space and therefore just skims the surface as a description of the proposed action.

Specific Comments

④
- Reference for Table 1.2-2 on page 1-3 is given as "Pace Company, 1978." None of this data is contained in our copy of "The Pace Study: An Analysis of the Demand/Supply Factors Affecting the Twelve Northern Tier States," dated August 1978.

⑤
- The route description on page 1-18, fourth paragraph does not correspond to the NTPC route description in in their Application for Site Certification to the Washington State Energy Facility Site Evaluation Council (EFSEC). The route leaves the high-voltage transmission lines before crossing the West Canal, not "to the vicinity of the Ephrata Airport," which is east of Ephrata. Also this paragraph does not mention the 10 miles of route in Adams County.

⑥
- Table 1.4-6,on page 1-20,does not mention any of the major highway or railroad crossings in Adams County.

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⑥ • In table 1.4-7, page 1-21, Major Stream and River Crossings, the West Canal is not mentioned; but the East Low Canal is cited as a crossing. The West Canal is a larger waterway than the East Low Canal.

• The number of irrigation canal crossings in Grant County displayed in Table 1.4-9, page 1-23, is actually 5, not 4 as stated.

• The remarks in Table 1.4-12, page 1-25, dealing with the block valve at Sec. 29 T.21 N R.26E in Grant County should read "West Canal crossing" rather than "Mainline Block valve."

⑦ • There is no mention in this section that station number 7 in Grant County is a Pressure Reducing Station rather than a Pump Station.

⑧ • On page 1-50, under "Abandonment and Disposal", the document states that "detailed abandonment procedures are discussed below." What follows is not a detailed description of the procedures but rather a general statement of procedures to be followed. No specific details are given as to removal of pump stations or pipeline sections in Grant County. An example of the language used is "Some sections of the pipeline might not be removed."

⑨ • Page 1-59 refers to a meeting (report of a meeting) held on June 9, 1978 with the Bureau of Reclamation in Ephrata, Washington. There is no other mention of recommendations and results of that meeting, specifically recommendations on overall placement of the pipeline and suggested specific route changes made by irrigation district personnel.

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### DESCRIPTION OF THE ENVIRONMENT
### CHAPTER 2

General Comments

This portion of the Draft Environmental Statement (ES) fits the criteria as a description of the environment but falls short in its description of the local environment. This again is due to the magnitude of the oil pipeline project and the relatively small amount of space devoted to the environmental description.

The ES only occasionally becomes site specific in its study of the environment. More often it makes general statements like, "Agricultural quality of soils along the route varies considerably.", and "Soil depth to bedrock or other parent material varies from a few inches in mountainous areas to 30 or more feet in the wind-laid silts of the Columbia Plateau." These kinds of generalities are helpful in understanding the pipeline as an overall entity but does little for the understanding of the environment on a smaller local level. Below are specific problems recognized in this chapter of the ES.

⑩ Specific Comments

• Table 2.1.2.2-1, Ambient Air Quality Data Measured Over the Proposed Northern Tier Pipeline System Route, on Page 2-49 is unclear whether locations that do not have statistics shown were not measured or did not register enough to show in the table.

⑪ • In the Topography and Geology portion of this chapter from the Columbia River to Sprague, is described as the "Channeled Scablands," followed by a general description of the terrain. The last sentence of the paragraph says, "Map section IV (map addendum) illustrates these terrain features." Unfortunately, the map addendum, because of its limited scope (quadrangle strip, covering approximately 4 miles) does not illustrate the terrain features of the "Channeled Scablands."

⑫ • In the soils Section 2.1.2.5, page 2-55, under Soil Series Maps and Table of Soil Series Maps and Table of Soil Characteristics. The following statement is made, "Some ratings and terms in these tables (contained in the map addendum) are not standard and are used solely for purposes of clarification within this document." No other reference could be found clarifying which terms are/are not standard.

⑬ • Several cultural resources identified in Grant County in Table 2.1.2.10-1, Prehistoric Archeological Sites along the proposed Northern Tier Pipeline Corridor, on page 2-106, do not appear in the map addendum, but fall within the 2 mile study area.

⑭ • The pipeline mile identifications for Prehistoric Sites in Grant County in Table 2.1.2.10-1, page 2-106 seem to be in error or mixed-up. Example: Site number 45GR68 is listed as pipeline mile 290. That mileage would put the site in Kittitas County rather than Grant For which it is listed. Others are incorrect as well.

⑮ • Also in Table 2.1.2.10-1, on page 2-106, Prehistoric Site number 45GR72 is not listed as being in or out of the 2 mile study corridor. Our studies show it is inside the study corridor.

⑯ • Under Social and Economic Conditions 2.1.2.15, page 2-140, the last paragraph states that, "construction spread 3 would begin near the small town of Quincy and cross Eastern Washington through Douglas, Grant, Lincoln... Counties, " etc. According to NTPC's Application For Site Certification to EFSEC, no construction will take place in Douglas County.

⑰ • On page 2-152, under Medical Services, the only mention of services in Construction Spread 3, is Douglas County. Douglas County is not in Construction Spread 3.

⑱ • 2.2.2 Future Environment-Pipeline System, 2.2.2.14 Recreation Resources on Page 2-162 reads, "A planned casino development in the Crescent Bar, Washington, area would change present recreation opportunity..." There has been no official statement or recognition of any casino development in the Crescent Bar Area. The only development in the area is a public recreation area leased under the Quincy Port district. In the forseable future, there are no plans to legalize gambling in Washington State.

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### ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION
### CHAPTER 3

General Comments

This chapter is consistant with both Chapter 1 and Chapter 2. In a general sense the impacts described are adequate, based on the information described in the previous chapters, but again the specific information required is not located in the ES. This makes the ES an over generalized document with little site specific data as a basis for this chapter.

Specific Comments

⑲ • In the introduction to this chapter, on page 3-1, a qualifying statement reads, "when quantification was not possible because of a lack of specific information, a range of values was assigned by professional judgement of the Environmental Statement team resource specialists." No reference or notations occur in this chapter to show where "quantification" leaves off, and "professional judgement" takes over. The distinction is important as to relative validity of the projected impacts.

⑳ • Section 3.2.2 Air Quality, page 3-56, states that fugitive dust impacts would be confined to the immediate vicinity of the construction site. In Eastern Washington, we've found that dust from construction activities (particularly in the Spring) is often carried several miles by winds, affecting larger concentrations of population than the immediate construction site.

㉑ • Section 3.2.3 Noise, Table 3.2.3-1, noise levels during pipeline construction, should include a noise level analysis for the construction impact on Ephrata's Oasis Park, a recreation area in South Ephrata. This park will be approximately 200 - 300 yards from the anticipated pipeline route. The park has overnight camping spots as well as day use capabilities.

㉒ • On page 3-59, under 3.2.4 Topography/Geology, in the 5th paragraph, it's stated that, "Excavating and grading for the pipeline could block or divert small surface drainages and result in minor impacts of short duration, 5 years or less." If small drainages, such as Lynch Creek, in Grant County, were diverted or blocked for "5 years or less," extensive impacts could occur below the blocked point. Also, 5 years is not a "short duration," in light of the kinds of topographic change that can take place in that amount of time.

㉓ • On page 3-65, paragraph 8, there is a discrepancy in oil spill per year projections (referenced OIW 1978) and the oil spill per mile per year projected in the NTPC, application for Site Certification to EFSEC, 2.11-65 (Aug. 1978). The ES projects a .0022 per mile per year frequency. NTPC projects .0012 per mile, per year frequency. Other spill projections seem to be consistant.

㉔ • Paragraph 1, page 3-70, states that leak detection time is 12 minutes. NTPC states that leak detection time is 10 minutes.

㉕ • Table 3.2.6-2, Maximum Potential Oil Spill, should include other bodies of water, particularly in Grant County, that may not be as large but could impact an area as large or larger than the rivers listed.

㉖ • Table 3.2.9-2, Potential impacts on Wildlife in Areas of Special Concern, page 3-90, states that Rocky Ford Creek is located at pipeline mile 314. The Map Addendum locates Rocky Ford Creek at pipeline mile 320.

㉗ • Section 3.2.11, Visual Resources, page 3-100, Segment 5, Columbia Plateau Statement: "An overhead crossing of the West Irrigation Canal near Ephrata would have a high visual impact..." The potential impact of an overhead crossing of the canal is much greater than just visual; increased potential for vandalism, and oil spillage into the canal affecting the entire Quincy Valley, are two impacts not noted.

㉘ • No mention is made in Section 3.2.15 Social and Economic Conditions, concerning the impact of added police protection of construction equipment and property, as a result of pipeline construction.

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### MITIGATING MEASURES
### CHAPTER 4

General Comments

This chapter is not an adequate description of mitigating measures that would reduce impacts described in chapter 3. No site specific measures other than those stated by NTPC are proposed, not even for specific impacts that have been identified in the previous chapters.

Mitigation is critical to such a large project as an Oil Port and pipeline system. Yet, this chapter treats the issue in such a general and non-specific manner, that actual benefits derived from this chapter are negligeble.

The writers of Chapter 4 seem to blame the NTPC proposal for the lack of specific information on the design of the project. But, we feel there was enough specific information and detail as to primary route selection and pipeline design to determine specific mitigating measures.

Specific Comments

• In the fifth paragraph of the introduction to Mitigating Measures Not Included in the Proposed Action, it states:

> "Presently available information on the proposal describes the pipeline route in terms of a 2 mile corridor...This information is not sufficiently detailed to identify and quantify most site specific impact. Federal, state, and local agencies generally require more specific information on proposed locations, design of system components, construction, and reclamation methods, and operating procedures to determine what mitigating measures would be required under existing regulations and codes."

• Rather than the above disclaimer, more thorough research into probable mitigating measures required by various agencies, particularly local jurisdictions, should be done.

• If, in fact, there are many mitigating measures not described in this ES, then the entire Environmental Statement process seems to have broken down.

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### UNAVOIDABLE ADVERSE IMPACTS
### CHAPTER 5

General Comments

The overriding flaw in this chapter is the same as in each of the previous chapters. But here, generalities and non-specific information cause much greater harm to the document than the preceeding chapters. This chapter, though, by the design of the ES, cannot become site specific and detailed until the prior chapters become the same. This is because the adverse Impacts are "sifted" from all the information presented earlier.

Specific Comments

• No specific identification.

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APPENDIX A

The following is a Problem Statement Summary and Prioritization. This summary coincides with problems identified and explained in Chapter V of this notebook, and represents Grant County's final prioritization of the problems contained in the notebook.

PROBLEM STATEMENT SUMMARY AND PRIORITIZATION - GRANT COUNTY

PRIORITY #1

- Plans call for no block or check valves at the Rocky Ford Creek Crossing, creating a risk of leak, spill or rupture. being larger and more damaging than necessary. Page 33
- There is no statement of who is responsible for damage costs associated with a major spill or leak. Page 48

PRIORITY #2

- An oil leak or spill could get into the irrigation system of the northern portion of the Quincy-Columbia Basin Irrigation Project, damaging agricultural cropland and resources. Page 20
- Litigation is an unrealistic method of reimbursing localities and citizens affected by a major oil spill due to the substantial legal resources of the oil pipeline company and length of litigation process, recovery may be beyond the resources of many localities and individuals. Page 48

PRIORITY #3

- An oil leak, spill or rupture into Rocky Ford Creek could seriously affect recreation, agriculture, wildlife habitat and quality of life in the areas of Moses Lake, Potholes Resevoir, South-Columbia Basin Irrigation District. Page 34
- Oil spillage into the East Low Canal would do considerable damage in the East-Columbia Basin Irrigation District below the proposed crossing. Page 39
- Total pipeline rupture would spill a maximum of 64,000 barrels (double if rupture occurs at a block valve or station). Page 48

PRIORITY #4

- An oil leak, spill or rupture into Crab Creek could seriously affect recreation, agriculture, wildlife habitat and quality of life in the areas of Moses Lake, Potholes Resevoir, South-Columbia Basin Irrigation District and East-Columbia Basin Irrigation District. Page 36
- Clean up of oil spilled into the West or East Low canals could do as much crop damage keeping water off the land, as the oil getting on the land. Page 49

PRIORITY #5

- Any oil spill in the Crescent Bar-Lynch Coulee area has a great possibility of being carried by Lynch Creek into the Columbia River, adversly affecting the Crescent Bar development and the entire Wanapum Pool. Page 14
- Any oil leak or spill into the West Canal would severely threaten all or part of the Quincy-Columbia Basin Irrigation Project. Page 24
- Oil spill clean-up and containment efforts would be hampered by the speed and disbursement of West Canal waters throughout the Columbia Basin. Page 25

PRIORITY #6

- An exposed crossing of the West Canal presents greater danger for vandalism of the pipeline, thereby increasing risk of leak or rupture. Page 22
- Small leaks in remote areas, under snowpack or earth cover could go undetected for a period of time, doing considerable damage in certain areas. Page 47

PRIORITY-#7

- Extra heavy equipment including trenchers, pipe haulers, etc., will be using county roads and bridges not designed for stresses of that nature. Page 45

PRIORITY #8

- Farmers may have to bear the expense of lowering or moving the pipeline if it is exposed by grading and contouring, required to get farmland below the elevation of East High new canals. Page 43
- Visual inspection will take place every two weeks, leaving leaks not detected by automatic sensing equipment, go for up to that amount of time or more if the leak is not detected on the first visual inspection. Page 47
- There is no detailed information presented on the methods or time involved in locating a leak for field repair once it has been detected through pressure sensing or input-output monitoring instruments. Page 49
- Studies forecast a spill in excess of 1,000 barrels somewhere in Grant County, about once in every 17 years. Page 47

PRIORITY #9

- If the Northern Tier Pipeline Company can move the pipeline within the designated two mile corridor after approval by the Energy Facility Siting Evaluation Council, then many county concerns will not have been answered by the time construction begins. In the time given, the county cannot document all concerns that could develop in such a wide area. Page 51

CONT

PRIORITY #10

- There is considerable potential for erosion due to flood/slides that could expose and damage the pipeline at both the alluvial fan (at the head of Lynch Coulee) and on the table above the fan. Page 12
- Operation and maintenance of the canal will be hampered during construction of the pipeline and may permanently be interferred by an overhead crossing of the West canal. Page 23

PRIORITY #11

- Future canals, and of the East High Development will be obstructed by the pipeline which will be built prior to East High Construction. Page 43

PRIORITY #12

- An oil spill or leak in this area could affect irrigation, recreation and quality of life in the Black Rock Coulee drainage. Page 41
- The proposed automatic leak detection system will be able to detect leaks to an accuracy of 0.5 percent of pipeline throughout (995,000 barrels/day at ultimate capacity) making the smallest leak detectable by the sensing equipment 4,665 barrels/day. Page 47

PRIORITY #13

- If the pipeline traverses the Grant County Sanitary landfill, disruption of present services and future developed services will occur and affect a large part of the county. Page 31

PRIORITY #14

- There is a conflict for space for both the oil pipeline (and right of way) and the proposed sewage lagoon in the alluvial fan at the mouth of Lynch Coulee near Crescent Bar. Page 11

PRIORITY #15

- An oil spill or leak into Oasis Parks' ponds or exit stream, along Highway 28, would greatly disturb recreation use and animal habitat of the park's southern portion. Page 29
- The oil pipeline, during construction and operation will interfere with irrigation activities in this area. Page 38

PRIORITY #16

- With an overhead crossing of the West Canal, an abrupt vertical drop in the pipeline must be made to go under the highway and the railroad. Page 28

PRIORITY #17

- The area surrounding the pressure reducing station may be wet during certain parts of the year, unable to support large structures. Page 17
- Both the State Highway and railroad (South of Ephrata) are so close, yet separated enough, that tunneling or boring under them might not be possible. Page 28
- During construction, a disruption of traffic and access will occur on both Highway 28 and Martin Road. Page 29

PRIORITY #18

- The proposed Pressure Reducing Station in Lynch Coulee is in an area susceptible to flood and run off water. Page 16

PRIORITY #19

- Recognized and unrecognized archeology sites may be disturbed by construction activities in Lynch Coulee, including areas on either side of the coulee. Page 13
- Recognized and unrecognized archeology sites may be disturbed by construction activities near Rocky Ford Creek. Page 33
- Land leveling and contour work associated with the East High irrigation development could expose the pipeline if buried at normal depth (36 inches). Page 43

PRIORITY #20

- Large trees will not be allowed to grow within the boundaries of the perpetual 75 foot right-of-way possibly restructing future orchard development along the pipeline route. Page 50

PRIORITY #21

- Recreation access to the Gloyd Seeps Recreation Area, including fishing, hunting, sightseeing, and photography, could be interferupted during construction
- Some communities in the county will experience short term increases in population (Ephrata is projected to increase 5.2 percent) due to construction activities, creating a potential problem in providing services. Page 46

PRIORITY #22

- Construction activity over Block 40 roads may interrupt (depending on season) farming and market traffic. Page 38

PRIORITY #23

- Soil Characteristics and topography in the Beezley Hills area make it highly susceptible to erosion from wind and water. Page 19
- Lack of adequate topsoil in many areas makes revegetation after construction activity extremely difficult. Page 19
- Construction in the Rocky Ford Creek and Crab Creek area during nexting season for birds and wildlife would obstruct several species using the stream and surrounding wetland. Page 33 & 36
- No provisions have been made to control dust emission from construction activities in rural areas. Page 45
- If construction occurs in the winter months, other, less desireable weeds and grasses may take over the construction right-of-way before reseeding can take place in the spring. Page 46

PRIORITY #24

- Recognized and unrecognized archeology sites may be disturbed by construction activities near the West Canal. Page 24

PRIORITY #25

- In rangeland areas, it has been shown that when native grasses are exhumed during construction, inferior grasses such as cheat grass will invade construction areas. Page 41

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ISLAND COUNTY
Historical Society
Formed in the interest of preserving the history of Island County

P.O. Box 305
Coupeville, Washington 98239

April 1, 1979

Bureau of Land Management
Room 1250 Lloyd Building
700 N.E. Multanomah
Portland, Oregon 97232

Gentlemen:

We request this letter be made a part of the environmental impact statement on the Northern Tier Pipeline Company's proposal for an oil port and oil pipeline from Port Angeles eastward across the state of Washington.

First, we apologize if we have incorrectly identified the EIS. Since we have never seen it, we don't know its title. We have requested a copy from your office by telephone, checked the local library and asked at the county courthouse, but no EIS was available. A citizen of Island County managed to get from a private source 14 pages of this EIS (entitled Ports and Cross Puget Sound Alternative) which we received yesterday, March 31st. We understand the deadline for comments is April 2nd. That gives us little time (one day) to evaluate something of the magnitude of Northern Tier's proposal.

Our "participation" in this proposal (a submarine and land pipeline through Island County) was announced only a week ago. This major change in route warrants a completely new EIS, but instead we hear there will not even be a change in input time limitations, let alone a new document.

This apparent disregard for concerned citizen input is regrettable. The Island County Historical Society, which has existed since 1949 and has membership in the hundreds, protests this highly insensitive and possibly illegal procedure. It is our hope that someone who reads this letter will be in a position to correct the injustice which seems to be happening here.

CONT

We address section 8.4.2.1 - CROSS PUGET SOUND:

Introduction and Description:

As this was an "alternative" route which is now the primary route, new alternatives must now be given - i.e. a new EIS should be prepared.

(Note: The 14 pages which we have contain no maps other than a cover page (Figure 8.4.1-2) which is almost impossible to read. It is therefore very difficult to visualize and pinpoint the pipeline route.)

Noise:

This short paragraph refers the reader to section 3.2.2 for information. As we have only section 8.4.2.1, we cannot so refer.

① Topography/Geology:

Information on the ocean floor of the waters surrounding Island County seems to be highly inadequate, as is information on the land masses.

Concerning earthquakes and their possibility: Only three weeks ago on March 12, 1979, we experienced a quake of 3.4 on the Richter scale. We experience quakes similar to this magnitude frequently in this area. On April 29, 1965, this area had a quake which recorded 6.5. This is a major earthquake area and should be treated accordingly. Much more information should be presented on this subject.

② Aquatic Resources:

Thousands of people in the vicinity of the pipeline in Island County get their water from private wells. According to Mr. Bruce Foxworthy of the U.S. Geological Survey, Seattle, petroleum substances are irretrievable when mixed into ground waters. Therefore, the inevitable leaks and accidents will be disastrous to potable water.

The reader is asked to refer to section 3.2.6, which we do not have.

It would appear the consequences of this proposal on fisheries could be economically disastrous.

Marine Resources:

The reader is asked to refer to section 2.1.1.7, which we do not have.

A submarine oil pipeline in any of the inland/Sound waters is entirely unacceptable to us until it can be proven beyond any doubt that a leak or spill of any magnitude will never occur. There is no room for conjecture here. A leak or spill will be economically, environmentally and historically disastrous.

The reader is asked to refer to figures 8.4.2.1-1 and 8.4.2.1-2, referring to oil spill trajectories, which we do not have.

The reader is also asked to refer to maps II-4 through II-10; and II-2 and II-3 (map addendum), which we do not have.

The disastrous impacts of the construction phase of the oil pipeline would be monumental and apparently unmitigated. There is no justification for this action.

The stated possibility that this pipeline may some day be abandoned and left in place makes one wonder why it is even being considered in the first place.

Terrestrial Vegetation:

The reader is asked to refer to section 3.2.8 regarding impacts on pasture and cropland and right-of-way maintenance from operation and oil spills. We do not have this section.

Terrestrial Wildlife:

The reader is asked to refer to sections 2.1.1.9 and 3.2.9, which we do not have.

Cultural Resources:

This is our area of expertise. The coverage given in the EIS to this subject is minimal concerning the vast historical importance of Island County.

The Central Whidbey Island National Historic District (which the proposal will transverse) contains ninety (90) Registered Historic Sites and is the second largest National Historic District in the United States. Designated in 1973, it is composed of approximately 8,000 acres and reaches from Admiralty Inlet and the Strait of Juan de Fuca on the west side of Whidbey Island to Penn Cove and Saratoga Passage on the east side. The waters that border this magnificent historic district are the waters that will contain this proposed submarine oil pipeline - the inevitable leaks and spills will destroy the character of one of this country's finest remaining examples of relatively unspoiled rural America.

The visual intrusion of an oil pipeline coming out of the water at Pt. Partridge would be intolerable for an area such as this. The change of character which would be caused by the presence of an oil pipeline anywhere in Island County would be intolerable. The changes of which we speak are subtle but nonetheless devastating to a sensitive area such as the Central Whidbey area and Island County as a whole. Both Whidbey and Camano Islands are lovely rural areas where oil in transport does not belong.

This area has also been recognized in the Historic American Buildings Survey of 1935, with eighteen buildings registered.

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The most recent evidence of the national historic significance of Central Whidbey Island is the Ebey's Landing National Historic Reserve, created by Congressional action in 1978. This new concept in preservation is now in the process of being developed by the National Parks Service, Island County and Coupeville officials and citizens of this area. Roughly, the idea of this Reserve is to purchase development rights to preserve and maintain the rich farmlands, forests and open spaces which by some miracle have remained here. Five million dollars will be appropriated for the first phase of this project. Ebey's Landing is located on the Strait of Juan de Fuca and Admiralty Inlet. The possibility that an oil pipeline will be anywhere in the area with the concomitant possibility of oil spills and leaks into the surrounding waters is unthinkable.

At the present time, we do not have sufficient information on archaeological sites in Island County. This lack of information is all the more reason not to dig and excavate.

Again, the reader is referred to a section we do not have - 3.2.10.

Visual Resources:

Again, it is difficult to evaluate the EIS because we are referred to information we do not have: section 2.1.1.11 and 3.1.11. The last section is apparently very important because it describes the cut proposed for Pt. Partridge. There is no way we can visualize a cut of this size and a pipeline not being a blight on the beauty of the area. The inference that the cut and pipeline will only be viewed by boaters is a simplification of the visual impact - it is in fact incompatible with this area and any other area on Washington's inland waters.

③ Recreation Resources:

To say there is only one developed public recreation area within the Cross Puget Sound corridor is meaningless and erroneous in this sense - the entire area is one beautiful recreation area. This proposal does not belong anywhere in Western Washington - it is absolutely incompatible with what exists here now, from Cape Flattery eastward.

④ Social and Economic Conditions:

There is not enough housing now in Island County for the increasing tourist trade. The influx of 500 nonlocal construction workers would aggravate this situation, and tourists would undoubtedly be on the losing end.

The impact of these construction workers would be major on the social and economic climate of a county like ours - the social crunch they will create when they are here and the economic vacuum they will leave behind are to be avoided.

⑤ In closing, we want to emphasize the economics involved in this pipeline proposal. It is very expensive to build and will prove costly to the consumer. There are alternatives. The economic benefit to Washington state is negligible. The adverse economic impacts, however, are monumental. The economic consequences to fisheries, for instance, could very well be disastrous.

The economic base of Island County has become highly dependent on this area's aesthetic and historical characteristics. Tourists are coming in increasing numbers. The tourist industry and related businesses are thriving. Many people move here and further contribute to our growing economy. All these people are attracted by the unspoiled beauty, recreational amenities and unparalleled historic heritage that is present here. These are vital economic resources that must not be tampered with.

Thank you.

Sincerely,

ISLAND COUNTY HISTORICAL SOCIETY

Joan McPherson

Joan McPherson
Historic Preservationist

Copies to:
President Jimmy Carter, Interior Secretary Cecil Andrus, Senator Warren G. Magnuson, Senator Henry Jackson, Congressman Al Swift, National Trust for Historic Preservation, Washington State Attorney General Slade Gorton, State Senator Pat Wanamaker, State Representative Sim Wilson, State Representative Joan Houchen, Island County Commissioners, Island County Planning Department, Town of Coupeville

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Department of Energy
Region X
1992 Federal Building
915 Second Avenue
Seattle, Washington 98174
(206) 442-7285

April 3, 1979

Al Leonard, ES Coordinator
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Leonard:

We have completed our review of the draft Environmental Statement for the Crude Oil Transportation System; Port Angeles, Washington to Clearbrook, Minnesota (As Proposed by Northern Tier Pipeline Company), dated January 3, 1979.

We are concerned that our comments on the preliminary draft dated August, 1979, which were submitted to you on November 1, 1979, have not been addressed in the January 3, 1979 draft. We feel strongly that the issues pointed out in those comments must be addressed if the final EIS is to meet the requirements of the National Environmental Policy Act. It is our understanding that we will not have an opportunity to provide you with further review and assistance prior to the issuance of the final EIS. Consequently, we may be unable to help assure the adequacy of the final document. We have attached a copy of our initial comments for your convenience and have expanded upon them below to provide additional assistance and to clarify and emphasize our concerns. In addition, we attached a comprehensive review and comment of the Economic Assessment of Alternative Project proposals as provided in Chapter 8.

Specific Comments

Chapter 1; Description of the Proposed Action

① Page 1-5: Table 1.3-1 : Governmental Agencies Having Project Approval Requirements. Add under the Washington State requirements, Energy Facility Evaluation Council, Finding of Consistency with the State Coastal Zone Management Act; Sec 307 Coastal Zone Management Act.

② Page 1-15: Support Facilities. The dEIS should indicate the level of funding anticipated by Northern Tier Pipeline Company (NTAC) to meet demands for onshore support facilities. Are these to be separate support functions solely funded and operated by NTPC or do they (NTPC) anticipate using existing support facilities (and additional construction as necessary) provided by Clallam County and/or the City of Port Angeles.

③ Page 1-24: Valves and protection systems for the pipeline are not adequate. Refer to original DOE comments to BLM, November 1, 1979, attached.

Page 1-31: Pipeline leak detection system. The current design parameters could allow thousands of gallons to be leaked, undetected. Estimates of the amount vary from 10,000 to 150,000 gallons. Please refer to original DOE comments to BLM, November 1, 1979, attached.

④ Page 1-35: Project Construction, Operation and Abandonment. In addition to the purely physical and technical considerations, assurance of NTPC funding for ancillary services necessary (police, fire, hospital, schools, etc) should be included in this discussion. This area of concern is not sufficiently covered in the Socio-Economic Chapters of the dEIS. This Chapter should address how these potential socio-economic impacts relate to actual project activities.

⑤ Page 1-54: Determination of contingency plans. The Environmental Protection Agency should be included as a major point of contact in the development and review of contingency plans.

⑥ Page 1-56: Additional Measures Proposed for Environmental Protection, Item 5, Restoration of disturbed areas. This statement appears to be misleading, particularly when compared to the statement in the Summary. "A trench for the submarine pipelines ascending to Green Point would leave a scar which would be a significant degradation of visual, biological, physical and human environment."

⑦ Chapter 2: Description of the Environment

Page 2-153: Social Conditions. Statement: "The Northern Tier Pipeline Company proposal has generated little controversy outside the Port Angeles area." This statement does not appear to recognize the significance of the fact that the State of Minnesota refused NTPC permits to cross the State.

⑧ Chapter 3; Impacts of the Proposal

3.1.2. Air Quality
Page 3-2 Summary. The mandatory Class I Air Quality designation for the Olympic National Park would prevent NTPC from their estimated violations of 5 - 6 times a year. The VALLEY despersion model used in the DEIS for the NTPC proposal predicts violations 5 - 6 times a year; introduction of a reasonable margin for error in the application of such a model gives good reason to anticipate that said violations would increase once the terminal is in operation. Alternatives to mitigate this should be explored, such as:

1. Use of an offshore monobuoy-type offloading terminal.
2. Use of electrically powered pumps and shutdown of tanker engines in ports, or
3. Use of low (less than 0.5%) sulfur fuel in port.

The document should include methods for enforcement of the PSD provisions of the Clean Air Act and a monitoring program for ambient SO on a continuous basis. If NTPC anticipates applying for a waiver of the Class I Air standards under Title V of the Public Regulatory Policies Act, this should be stated in the DEIS.

⑨ Page 3-3: "Impacts on air quality would be limited to the immediate vicinity." The document should define the air shed and based on the geographic data, define "immediate area."

CONT

⑩ Page 3-5: Particulates. Particulate emissions from the pulp and lumber processing in Port Angeles should be included and a model should be run on the particulate emissions. It is not apparent from the argument, as it is now stated, that this (particulates) concentration would remain below that permissable in a Non-Attainment Area (as Port Angeles is currently classified). The DEIS presently recognizes only "fugitive dust" as part of the particulates problem, and should also address emissions from the existing industry, i.e. Crown Zellerbach and ITT Rayonier.

⑪ 3.1.7 Marine Resources
Page 3-15: Summary. Refer to DOE comments, November 1, 1979. The DEIS does not adequately address the problems related to the potential impacts on the Elwha salmon enhancement project. In particular, the oil spill trajectory models as contained in the DEIS are contrary to those accepted by National Oceanographic and Atmospheric Administration. (NOAA) (NOAA Technical Report ERL 399-PMEL 29 - Circulation in the Strait of Juan de Fuca: Some Recent Oceanographic Observations, G.A. Cannon, Ed., June 1978).

⑫ Chapter 4: Mitigating Measures

It appears that many of the proposed mitigation measures which appeared in the Preliminary DEIS have been deleted. Even in that document we did not believe that the mitigation measures were explored adequately because of a stated lack of information necessary to assess their viability. Example: 4.5 Air Quality. To state that no significant mitigating measures were identified in this Chapter appears to be contradictory given that the document describes practices which NTPC intends to implement in order to keep emissions within an acceptable range in Chapter 3. If, as stated, Class I Air Quality areas will be violated 5 to 6 times a year mitigation measures should be discussed here.

Page 4-6. Discussion of the aerial flyovers of the pipeline (Item 2) by the Department of Transportation. The NTPC should provide more in depth analysis of the state of the art of pipeline valve and gauge systems in order to ensure that at critical fish habitat areas the line pressures would be sufficiently monitored for leak detection. Current NTPC design criteria could allow up to 150,000 gallons to be spilled in remote sites before a pressure drop would show at a monitoring station.

⑬ Chapter 5: Unavoidable Adverse Impacts

Page 5-4: Topography. The DEIS should address possible measures to mitigate the "unsightly permanent scar" at Green Point.

We look forward to a continuing dialogue with the Bureau of Land Management to discuss these areas of concern and to resolve the associated problems. Please do not hesitate to call me at 442-1746.

Sincerely,

Bob

Robert Hackman, Director
Office of Assessment
and Integration

cc: Mario Cardullo
Robert Stern

Department of Energy, Region X
Comments on Chapter Eight
Draft Environmental Statement, January 3, 1979

⑭ The following comments address the Economic Assessment of Alternative Project proposals as provided in Chapter Eight. They are presented in two parts. The first summarizes what we believe to be overall areas of concern and the second provides more specific detailed comments which are cross referenced by page and paragraph.

A. OVERALL ASSESSMENT

1. Chapter Eight "Alternatives to the Proposed Action" would appear to have as its objective, the presentation of information on alternative proposals or actions in sufficient detail to evaluate the merits of each alternative as compared to the Northern Tier Pipeline proposal. This information should address such additional items as:

Physical description of the proposal

Capital Costs

Tariff estimates

Construction time

Project proponents

Environmental impacts associated with each alternative

Capability of each alternative to meet the need

The above list is not inclusive, but contains examples of the items listed in Title V of the Public Utility Regulatory Policies Act, which are intended to be used by the President in evaluating a proposed project. The material in Chapter 8 presents only a "broad brush" summary of the physical description of the alternatives, which is insufficient to evaluate these alternatives and does not meet the information requirements specified under Title V. Much of this data is however contained in the Department of Energy's Petroleum Supply Alternatives which could be used to improve this section.

2. Since publication of both this draft EIS and DOE's draft study, some project proposals, i.e. Foothills and Transmountain have made substantial changes to their proposals. These changes and the effects these changes might have on their viability should be reflected in the final draft.

3. The Chapter would be substantially improved if it contained a discussion of Title V of the Public Utility Regulatory Policies Act. This discussion should contain:

A summary of Title V, including its purpose and the deadlines for filing under the act.

CONT

⑭ A summary of the data requirements and how this data may be used by the President in selecting none, one, or more applicants for expedited Federal permitting and the effect of such selection.

A summary of the applicants which have filed under Title V and the implications to both DOI and the applicants who have filed.

4. Several paragraphs in chapter eight, are written in such a way as to give the appearance of bias on the part of its authors for the the Northern Tier Pipeline proposal. Some of these have been identified in the more detailed comments that follow. We do not suggest this appearance is intended, however, its presence may detract, from the legitamacy of the report.

The following comments address specific points and are referenced to each page and paragraph of chapter eight:

⑮ 8-1 7 There are three proposed Arctic main systems, not one, as mentioned in the report. They are DOME, SEATRAINS, and GLOBTIC and they should all be mentioned in the text.

8 The unit train alternative as proposed by GATX should be addressed because it provides a system for transporting crude to potentially deficient areas. The criteria used to eliminate this system is inappropriate. The proposal evaluation should be based on the projected needs of the areas it is designed to serve and not eliminated from consideration because of the greater capacity of another system. The fact that the NTPC has a capacity of 933 MB/D is not sufficient reason to eliminate a proposed alternative with less capacity. We also note that this justification, if appropriate, could have been used to eliminate consideration of other alternatives, such as the transmountain reversal proposal with a 300 to 400 MB/D capacity and thus its use to eliminate the unit train alternative is not only inappropriate but is inconsistent with the assessment of other alternatives. Also, the unit train proposal is intended to serve very specific markets and depending on projected shortfalls, may completely meet those needs. Therefore it should not be considered a "complimentary system."

⑯ 8-2 1 Other energy sources, such as coal, solar, and synthetic crude should be considered but, considered in making energy forecasts that are used to determine energy shortfalls which assists in determining the need for a project. Petroleum consumption may be lessened in the future to the extent these other sources are consumed and consequently the need for a new crude transportation system or portion of its capacities may also lessen.

⑰ 8-2 2 Increased domestic production and reallocation of domestic supplies do meet the purpose of the proposal because these methods can serve to reduce the need in crude deficient areas; and therefore, the need for all or a portion of the capacities of a new transportation system. Also, exchanges with Japan would reduce the surplus of crude on the U.S. West Coast by providing an additional market. However, such a trade can by law only occur under rather specific conditions. If the possibilities of a trade is mentioned in your report, you should also mention the pertinent laws and conditions under which a swap could occur.

⑱ 5 Question: Couldn't denial of the permit to cross Federal lands prohibit construction and operation of a crude pipeline system rather than forestall it? Also, another consequence (of permit denial) might be the conservation of capital (dollars) and raw materials and energy (both in terms of energy used to construct the materials and to pump the oil) if the project were not needed or if a smaller project better met the needs of an area.

8-2 6 Transshipment of ANS crude through the Panama Canal does increase transportation costs but may not increase product costs to the ultimate consumer. All crudes are essentially sold at the same price (quality differences considered) and to the extent there are increased transportation costs these reduce the net back value to the crude producers. Therefore, the crude producers and their stockholders may realize losses rather than customers.

⑲ "A delay in permit approval for the Northern Tier proposal might affect the implementation of other alternative proposals."

This appears to imply that if the NTPC permit is delayed, another proposal could be permitted in lieu of the NTPC proposal. If so this could be construed as a statement biased toward the NTPC.

⑳ 8-5 3 "Several methods and transportation systems were examined as alternatives for meeting the purpose of the NTPC proposed action." We do not believe that it is correct to evaluate alternative systems based on NTPC proposed actions. Alternatives including the NTPC should be examined against a set of criteria which should include need, cost, environmental impacts, etc., no other system can be compared favorably to the NTPC proposal if it is the NTPC proposal which establishes the criteria for evaluating the other alternatives.

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㉑ 5 Foothills The project description is very difficult to understand unless one is already thoroughly familiar with the proposal. Foothills, originally had four separate proposals. Two extend from Delta Juction, one going to Keg River and one to Edmonton. The other two extend from Skagway to the same two locations cited above. This should be expanded and more fully described, particularly the linkage between Keg River and Edmonton. However, Foothills has made changes to these proposals and this new information should be included in the final report.

6 Presently, Foothills has applied under Title V of the Public Utility and Regulatory Policies Act of 1978. This fact and its implications should be discussed.

㉒ 8-6 1 We do not believe the trans-Mexico pipeline proposal continues to exist, however there are rumors of plans to construct an East to West pipeline for export of Mexican oil to such countries as Japan. The final report should reflect these developments.

㉓ 4 There are prohibitions concerning export of ANS crude but use of a trans-Guatemala line for delivery to U.S. markets need not be considered as export. The pipeline is considered a "free port" and as such oil is not considered to have been exported. This needs further clarification.

㉔ 7 The summary of the mid-continent systems if largely devoted to describing the Panama Canal and its limitations. The Panama Canal data should be located in the "Panamanian Transshipment" section. Presently, little information is provided on mid-continent system in this summary.

8-6 11 The expanded facilities at the Pananamian Transshipment Port (TSP) should be discussed, not only in terms of its capacity to move crude oil through its own facility, but also its capacity to move crude through the Panama Canal, even though the transshipment facility is a separate operation from the Panama Canal it serves to expedite crude oil shipments through the canal.

㉕ 8-7 5 To be fair and consistent in assessing the no-action alternative the report also includes a statement to the effect that, "if the NTPC is constructed and no crude oil shortage develops, the system may be construed by some as a waste of capital and resources."

6 It should be pointed out that there is crude in excess of West Coast demand but not in excess of U.S. demand. Alaska production will not be reduced because of West Coast demand but only because of cost factors or insufficient transportation modes to move it to other markets.

㉖ 8-98 3 How would completion of the Foothills proposal, designed to deliver crude to Canada's Interprovincial Pipeline, lower the unit transportation cost of the Canadian system?

㉗ 104-105 The discussion regarding the transmountain proposal needs to be updated to take into consideration the new proposal under Title V of the Public Utility and Regulation Policies Act. The proposal now includes a port at Low Point and a system for supplying Vancouver refineries.

㉘ 108 The discussion regarding Standard Oil of Ohio's original proposal contains several errors and the following comments address these, however SOHIO appears to have withdrawn the project from consideration. The final report should reflect these latest developments. These include the project title which is PACTEX, the estimated through put which is 500 MB/D not 600 MB/D, and the manner in which the ultimate capacity is described. The discussion should discuss the conversion of one of several natural gas pipelines which will allow 500 MB/D to move to Midland, Texas. Another gas pipeline could be converted in the future which would allow another 500 MB/D to move to that market. However, conversion or any measures to begin such conversion have not been initiated. The overall discussion would be substantially improved by providing a current status of this project. This project is by far the furthest along in terms of permitting and would have a substantial impact on the level of crude oil surpluses in the West Coast, oil which might otherwise find its way into a "Northern Tier" pipeline.

The PACTEX proposal has obtained all necessary permits required to construct (about 700 in number) except a California coastal one and an air quality permit.

There appear to be few problems in obtaining the coastal zone permit but uncertainties remain in obtaining the air quality permit. One of the concerns centers on a pending U.S. Internal Revenue Service ruling which will determine if California Edison must declare as income the scrubber given to it by SOHIO as part of SOHIO's air emission offset scheme. California Edison has said it would not accept the scrubber if it must declare it as income.

CONT

The information provided is sketchy. It should be updated, verified, and included in the final environmental statement to provide a reader the best estimate of whether the PACTEX proposal will be constructed and its impact on a "Northern Tier" pipeline.

㉙ 8-109 The trans-Mexico pipeline proposal was advanced by its proponents for only a very short time and has since, I believe, been dropped. You may wish to eliminate the entire discussion on this project or at least put it in proper perspective as being only a short lived idea and provide a current project status. From the data presented one might conclude it is still being actively pursued. In addition, another pipeline moving Mexico crude oil from east to west for export to perhaps Japan has been recently proposed as a joint Japanese and Mexican project. This information however needs to be verified.

㉚ 111 6.8 The paragraph references a FEA study showing the capacity of the Panama Canal to move ANS crude oil at 500 MB/D. This figure seems inconsistent with the disucssion on the Panama Transshipment facility which has capacity to move up to 900 MB/D. The 500 MB/D capacity figure is dated and probably does not reflect the facility.

Risks associated with transit should also reflect the high capacity data rather than the 500 MB/D shown in paragraph 8.

㉛ 113 13 "As shown, six major..." The number should be five not six.

㉜ 14-15 The discussion regarding potential impacts of expanding the mid-continent pipeline system is a bit misleading. Expansion of most systems involve adding pump stations or looping. In these instances there is usually little additional adverse impact because the additions are normally located in the same right-of-way as the existing line. Air quality could be adversly affected by increased tankers at Gulf Coast Ports and should be considered.

November 1, 1978

Al Leonard
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Leonard:

We have completed our review of the preliminary draft EIS for the Northern Tier proposal and recognize that it is a first effort and that BLM is of necessity still engaged in the process of obtaining much of the necessary information for the final report. However, there are several major areas which we feel require significant additional information and supporting analysis if the final document is to meet the requirements of the National Environmental Policy Act (NEPA) and the tests to which it may be put. Our comments point up these areas with the hope of assisting you in your efforts to achieve a final quality product.

Our response is limited to general areas of concern. It is our hope that the final review process will permit a minimum review period of sixty days so that our assistance may be of a more substantive, specific nature.

General Comments

The following general comments pertain to certain sections of NEPA which form the general basis on which the document must be constructed and which in our belief are not yet adequately addressed.

Sec 102(2)(C) The EIS does not provide a sufficiently thorough discussion of the significant aspects of the probable environmental impact of the proposed agency action. In its simplest interpretation, NEPA is an environmental full disclosure law, and the Environmental Impact Statement as addressed in this section should, at a minimum, contain sufficient information to alert the President, the Congress, the Council of Environmental Quality, other governmental entities and the public to all known possible environmental consequences of the proposed agency action. The law requires that the record be complete. The complexity of the proposed action by Northern Tier requires more in-depth analysis and a greater level of detail than is currently present in the preliminary draft. It is not clear that areas designated as being of "no significant impact" are indeed such because sufficient information supporting such statements is not provided. It may appear to some that certain areas of potential impact have been labled "no impact" due to a lack of information rather than as a result of thorough analysis. This is discussed in Chapter 4 of the document in the portion concerning agency discussions of proposed mitigation strategies. In general, the current lack of detail may cause some to believe that the document may be obscuring the environmental effects of the proposed project. It is worthy of note that lack of sufficiently detailed information and analysis has been used by the courts as a basis for finding a particular EIS inadequate.

Sec 102(2)(C) and (D) These sections seek to ensure that each agency decision maker has before him/her and takes into proper account all possible alternatives to a particular project. At this point in time, this document will not enable the decision maker to evaluate alternatives and their related impacts.

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㉝ Sec 102(A) and (B) Although the scope of the draft statement's cost benefit assessment is approached comprehensively, its conclusions are not supported in such a way that the thoroughness or validity of the research upon which they are based can be determined as required by this section.

Sec 102(2)(C)(iv) and (v) This section requires that a finding is made that proposed uses are consistent with the maintenance and enhancement of the long-term productivity of the environment wherever local, short-term uses of the resources of man's environment are being proposed. Currently these short-term use effects are not sufficiently described, nor in our belief are the socio-economic mitigation strategies for dealing with these impacts adequate to meet the requirements of the Act.

Sec 101(a) and 102(2)(F) This section requires that the environmental statement meet the requirements of a wide range of actors. Currently the EIS does not provide detailed information required to provide a basis for expert reading of the statement's adequacy nor upon which decisions by local, State and Federal governmental agencies may be made. This is noted in Chapter 4, example: 4-22 where the ~~document~~ comment is made that State and local agencies contacted could make no commitment to enforcing mitigation measures until all facts concerning the applicant's project are known.

Specific Comments

Alternatives to the Proposed Action Sec 102(2)(C)(iii) and (2)(E) of NEPA state that "consideration of alternatives must be as thorough as the consideration of environmental impact." The description of the environmental impacts of alternatives is currently incomplete and consequently does not satisfy this requirement. Discussions of related short and long-term effects do not provide adequate information to assess the related impacts of the proposed alternatives.

The alternatives do not address the possible availability of oil from other sources to meet the Northern Tier States projected needs. The possibility of an agreement with the Canadian government to supply Eastern Washington and Montana as well as the potential availability of oil from the Mexican fields distributed through existing supply lines should be addressed.

The document should also address the potential long-range impacts of associated commercial/industrial buildup in Western Washington if facilities are to be established for use of the oil in this area. For example, the potential for petrochemical manufacturing firms to locate in the area due to the increased availability of Alaskan oil in the region should be discussed.

Additional analysis of the tradeoffs related to the impact of the oil port should also be provided in the document. For example, the document should identify alternative recreational sites which are available to replace those lost as a result of the proposed project and should fully describe the economic and environmental impacts associated with the projected loss and/or relocation of the recreational fishing industry. The document addresses this impact only in its description of loss of moorage sites. It should be expanded to present a complete analysis of the recreational losses and alternatives which may mitigate these losses.

㉞ Regional Comprehensive Planning Programs The document does not provide reference to existing planning efforts in the region. Clear reference should be made to all regional planning efforts to show that the proposal is consistent with existing comprehensive planning efforts, i.e. 208 Water Quality Management Plans under PL 92-500 and 95-217, the Clean Water Act and the 1977 Amendments; Coastal Zone Management Program Plans; Air Quality Plans including definition of Non-attainment Area and Northern Tier's impact on existing air quality.

The present lack of a comprehensive baseline economic development plan for the Port Angeles areas causes difficulty in evaluating the potential impacts of the Northern Tier proposal. It is difficult to understand how the draft EIS can state that "there is not impact" or that "these are the effects" of impacts without support of baseline information. For example, there appears to be inadequate lead time for the construction of necessary community facilities, in particular health care and public institutions, given the Northern Tier's proposed construction schedule. There is no clear understanding of the intent of Northern Tier to address the social and economic impacts of the proposed action expressed in the document.

An example of sub-regional planning and ongoing program efforts that should receive more thorough consideration is the program to reestablish the salmon runs in the Elwa River by the Elwa Indians. In particular the potential impact of tankers lightering outside Ediz Hook which may cause movement of oil towards the mouth of the Elwa due to near shore current net direction to inland waters should receive attention. Juvenile salmon spend time in the potentially affected area before moving out to sea.

㉟ Land Use and Water Quality Aspects of the Pipeline Corridor Information regarding the pipeline corridors is lacking in sufficient detail. A clear understanding of the potential environmental impacts of each segment of the proposed pipeline needs to be included in the final document in order to provide the decision-makers with adequate information and to meet requirements of NEPA, Sec 102.

A primary example of this lack of information concerns the leak detection system for the pipeline. Although the applicant mentions several pump stations with check valves before and after river crossings, it is not clear upon what baseline information this decision was made, nor whether the criteria of monitoring river crossings only is sufficient to detect potential line pressure drops. Many large streams where significant impacts could occur are not included in the safeguard plan. The potential for environmental damage is significant and appropriate mitigation planning should be provided.

The proposed system detects differences in line pressure between checkpoints only if the line pressure drop is greater than 1.5%. Should a leak occur that results in a pressure drop of less than the 1.5% proposed threshold. There is no proposed way of detecting its existance until physically observed. Hence, a significant potential for environmental insult is present.

The backgound data upon which decisions to route the pipeline were made is not presented and therefor it is difficult to assess the adequacy of the route. It would appear from the information presented that the pipeline crosses many areas of potential hazard that are not adequately addressed; for

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㉟ example, there is not sufficient data presented on erosion patterns and areas of landslide activity. Soils information is also lacking, and is important in light of the fact that transient oil escaping from a leak, if undetected, could move laterally through permeable till layers to an aquifer, either ground or surface water. Thus, oil could enter systems where the potential for damage is great, i.e. to potable ground water for domestic supply.

Another example of potential danger that should receive thorough consideration exists where the proposed pipeline crosses the Green River Gorge. Here stresses in the line may be created by instability of the channel. This channel has been observed to shift at a rate of 1,000 feet during the past ten years.

Secondary Effects of Development The document presently lacks clarity in its discussion of project-related growth which may increase the range and intensity of the identified social, economic and environmental impacts. The document needs to address potential problems which are related either directly or indirectly to the project. An example of this is the identified source of the proposed construction workers - are they from the local casual labor work force, or will most be brought in? Are there long-term employment opportunities for these workers related to the project, or will they be faced with relocation after their particular role in the project has been accomplished?

An additional area of concern is the secondary impact of the proposed roads for construction, maintenance and long-term monitoring of the pipeline route. Where these roads traverse previously undeveloped areas, there could exist increased potential for new sources of development which the statement should address. A related problem results from potential impact on wilderness areas which have not been accessible by motor vehicle. It is unclear in the information presented whether access to the pipeline route will be protected by gates, fences, etc. Some of the lands surrounding the proposed pipeline corridor are under consideration in the U.S. Forest Service's RARE II process. In areas where these RARE II lands are involved, alternative routes need to be presented and their related impacts addressed.

Mitigation Strategies

International Boundary Considerations The document does not address the problems associated with mitigation of potential spill impacts on British Columbia shores, nor those potential impacts which would affect the migratory patterns of anadromous fish, i.e. salmon runs in the Fraser River area. Consideration of these potential problem areas should be included in the final statement.

Mandatory Hookup Without a mandatory hookup requirement for existing Puget Sound refineries, the resulting tanker traffic may well increase the incidence of tanker accidents in the Straits of Juan de Fuca. The draft EIS does not adequately address the potential cumulative impacts associated with the existence of three separate ports in action versus impacts if tankers are restricted from entering inland waters east of Port Angeles. This information should be presented with appropriate mitigation strategies in the final document.

We are pleased to have had this opportunity to respond to this preliminary draft Environmental Impact Statement. We look forward to a continuing dialogue with the Bureau of Land Management to discuss areas of concern which we find exist in this preliminary document.

Should you have any questions concerning Region X DOE's comments, please do not hesitate to call me at 442-1746.

Sincerely,

Nan Nalder
Environmental Specialist
Planning and Analysis Division

cc: Bob Stern
Mario Cardullo

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LAW OFFICES
SMITH, BRUCKER, WINN & EHLERT
FOURTEEN ELEVEN FOURTH AVENUE
SEATTLE, WASHINGTON

April 2, 1979

Mr. Merle Storms
Oregon State Director
Bureau of Land Management
P.O. Box 2965
Portland, OR 97208

Mr. Guy Martin
Assistant Director
Land and Water Resources
Department of the Interior
18th and C Streets N.W.
Washington, DC 20240

Mr. Frank Gregg, Director
Bureau of Land Management
Department of the Interior
18th & C Streets N.W.
Washington, DC 20240

Gentlemen:

We have completed our review of the draft environmental impact statement for the Northern Tier proposal. We realize that the document published in January of 1979 is only a draft, and that the BLM, in cooperation with other concerned federal and state agencies, is engaged in the process of providing some of the supplemental information necessary to complete the environmental impact analysis.

However, in light of Northern Tier's recently announced change in the routing of the pipeline in the state of Washington, we do not believe that the DEIS submitted last January fulfills the requirements of Section 102(c) of the National Environmental Policy Act. We object to the Bureau of Land Management's intent to treat the DEIS evaluating a crude oil transportation project for a land-based pipeline around Puget Sound as if it addressed the pipeline corridor announced publicly by NTPC two weeks ago. Northern Tier now proposes to construct a submarine pipeline from just north of Sequim under Puget Sound crossing both Whidbey and Camano Islands and travelling east to Arlington, where it turns south to North Bend. We feel that the two routes are different and must be evaluated as separate proposals.

The Bureau of Land Management's voluminous DEIS analyzing the pipeline route around the Sound does not include a substantial discussion of the submarine route now favored by Northern Tier. The fourteen pages of analysis of the "cross Sound alternative" included in the DEIS makes a mockery of the legislative intent of Section 102(c)(iii) of NEPA. The circuit court found that discussion of alternatives to the favored proposal should attempt to assess the environmental risk of each in comparison to the proposal.[1] The environmental analysis of the cross sound alternative provided by the BLM merely jots down potential problems which are not even site specific and evaluates its risks compared to the original land-based route.

There is a complete absence of substantive baseline data and research of the cross Sound proposal. Without it, the meager comments on the impacts of the route are inevitably broad generalities, useless to federal and state decision makers. The DEIS comments on soil instability over the 140 miles of the cross Sound route are simply:

> "Some alluvial valleys are inferred to contain potentially liquefiable soils, but no sites have been identified."[2]

River basins worldwide are frequently characterized as highly unstable and prone to liquefaction. The BLM's comments could be found in any soil science textbook, and reveal a complete lack of field work. Without field analysis, the DEIS is merely an academic exercise.

1 Nor are the comments on the cross Sound alternative reasonably complete. There is no mention of possible geologic faults in Haro and Georgia Straits, one of which crosses Whidbey Island just north of Oak Harbor within miles of the proposed pipeline route.[3] In light of the fact that the fear of earthquakes generated by these faults has impeded the construction of the Skagit Nuclear Power Plan at Sedro Woolley, the BLM's omission is irresponsible. 2 Imperative considerations, such as oil spill trajectories from a ruptured submarine pipeline between Whidbey and Camano Islands are ignored as well.[4]

The BLM's discussion of the cross Sound route is too weak to satisfy the standards for alternatives to the proposal set in Natural Resources Defense Council v. Morton, 7 ERC 1298, that the analysis be of sufficient depth to permit the reviewer to make a reasoned choice. Yet, the BLM is proposing that those same fourteen pages of scanty analysis are sufficient to be considered a discussion of a 140-mile segment of the main project proposal. To forge ahead with the environmental review process based on an obviously inadequate environmental impact analysis is a gross violation of the intent of NEPA.

To continue with the environmental review process when the bulk of the DEIS does not deal with NTPC's preferred route, but a discarded one, inevitably questions the BLM's good faith compliance with NEPA. It is not unreasonable to surmise that the legislative assumption behind Section 102(c) was that the environmental impact statement would address the proposed project.

Unfortunately, the BLM has apparently overlooked this common sense assumption in their urgency to expedite the environmental review process. Although the DEIS for Northern Tier's Crude Oil Transport System is over 800 pages long, only fourteen pages consider the cross-Sound pipeline route. Approximately 65 pages of the DEIS evaluate the around-the-Sound pipeline route which is no longer the major proposal as of March 23, 1979.

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Northern Tier's route change covers a minimum of 140 nautical and land miles that are barely mentioned in the bulk of the EIS. The BLM cannot in good faith presume that one hundred and forty miles of pipeline route crossing straits and estuaries, a wide range of land forms, soils, and habitats, and passing adjacent to national historic sites, state parks and population centers can be credibly assessed in a mere fourteen pages. Though quantity does not ensure quality, the courts have recognized a correlation between the number of pages and the thoroughness of the analysis of an EIS. In Sierra Club v. Stamm, 6 ERC 1848, the court determined that a two-page discussion of alternatives in an EIS indicated that there had not been an examination to the "fullest extent possible" of alternatives to the proposal. The court's reasoning demonstrates the absurdity of the BLM's assertation that a new DEIS is unwarranted by the siting change of the NTPC pipeline. A 140-mile pipeline segment of a major proposal simply cannot be adequately scrutinized in a mere 14 pages.

In his letter of March 26, 1979, Gordon Conger, attorney for Northern Tier, acknowledged that modifications of the state of Washington's DEIS would be necessary. Rerouting the pipeline across the Sound will place Snohomish and Island Counties along the corridor. NTPC plans to submit to Washington's Energy Facility Site Evaluation Council by March 30, the maps and baseline data necessary for a preliminary evaluation of the new route. Intervening parties will have until the end of May to gather pertinent route information when NTPC will submit the state DEIS to the Energy Facility Site Evaluation Council.

Apparently, NTPC is a better guardian of the environmental review process than the BLM. Anticipating the need for supplemental review materials specific to the changed route, NTPC is willing to delay the environmental review process until enough baseline data has been gathered to evaluate the proposal's impact on Washington State in its entirety.

The delay enables government agencies with the proper expertise sufficient time to gather the essential baseline data for a detailed analysis of the project proposal. Calvert Cliffs Coord. Com. v. AEC, 2 ERC 1779, 449 F.2d 1109. The courts have wisely determined that it is beyond their competence to gather and evaluate the baseline information essential to reasoned decision making. Appalachian Mt. Club v. Brinegar, 8 ERC 1189.

The BLM has fallen short of its responsibility as a lead agency defined under NEPA to coordinate the information gathering process of other governmental agencies. NTPC's route change impacts approximately 140 miles in the Puget Sound basin, yet state and federal government agencies such as the Soil Conservation Service and the Department of Ecology have not contributed even the sketchiest baseline data required of an environmental analysis. Pushing ahead with an EIS review schedule based on a document which is practically mute on a 140-mile segment of the project makes it impossible to responsibly review the consequences of the entire NT pipeline system.

3 We propose that the DEIS review process be postponed until NT and the appropriate government agencies have supplied baseline data specific to the cross Sound route. The Northern Tier pipeline system could have enormous impacts on the environmental and socio-economic conditions of the cities and counties along the corridor. The hazards and impacts of the pipeline will differ from area to area and so must be assessed independently.

Since the pipeline will be a continuous interstate system, the impacts of siting the pipeline close to possible fault lines in Puget Sound could impact the flow of oil hundreds of miles away. To satisfy NEPA, all the relevant data for the entire pipeline system should be included in one comprehensive impact statement. The courts have warned against the hazards of piecemeal evaluation of the impacts of a project. Appalachian Mountain Club v. Brinegar, 8 ERC 1189. The cross Sound pipeline segment cannot be examined independently of the pipeline system. To proceed with the environmental review process at this time without addressing the route change across Puget Sound ignores an essential link in this interstate system, violating the legislative intent of NEPA.

> "Since the whole is the sum and total of the parts, to deny a part of an interstate system is to deny the system itself."
>
> Appalachian Mt. Club v. Brinegar, 8 ERC 1196.

In an attempt to comply with the intent of Title V of the Public Utility Regulatory Policies Act of 1978 (16 USC 2601), the Bureau of Land Management is adhering to the schedule set for evaluation of NTPC's original proposal. The BLM assumes that the review process for the pipeline proposal will be expedited by relying on the DEIS written for the around-the-Sound pipeline route. Yet, the DEIS circulated last January is incomplete due to Northern Tier's recent change in the proposed route. The BLM claims that the 14 page discussion of the cross Sound alternative in the DEIS contains sufficient data to describe a 140 mile segment of the pipeline route.

Without an initial temporary delay in the review process to allow for the submission of supplemental baseline maps and data, the BLM is actually obstructing the review of the pipeline proposal. Section 506 of the Public Utility Regulatory Act does not preclude the preparation of adequate environmental impact statements. A DEIS which barely mentions a 140 mile segment of the project is clearly not a detailed statement that will enable the President or any other decision makers to evaluate and balance the potential costs and benefits of the proposal. Rather than expediting the review of the Northern Tier pipeline proposal, the BLM's actions will result in years and years of costly court battles and litigation. A small delay in the initial review process is far more consistent with the purposes of both the Public Utilities Act and NEPA now, when there can be a real analysis of the proposal's impacts. Litigation ensuing from challenges to the adequacy of the impact statement could become so costly that construction of the pipeline might become impossible. Prohibitive litigation costs could force Northern Tier to abandon their proposal just as SOHIO was recently forced to do.

Very truly yours,

SMITH, BRUCKER, WINN & EHLERT

Thomas H. S. Brucker

THSB:gs

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[1] Natural Resources Defense Council v. Morton, 7 ERC 1298.

[2] DEIS, Crude Oil Transportation System, p. 8-50.

[3] Dr. Eric Cheney, Transcripts of NRC Hearings in the Matter of the Skagit Nuclear Power Projects, pp. 1134-1406.

[4] DEIS, p. 8-54.

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TEXT OF COUNTY ORAL COMMENTS REGARDING
DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR
CRUDE OIL TRANSSHIPMENT FACILITY

1 Presentation given by County Commission Ron Richards
and County Planner Jim Falk at
March 15, 1979 Hearing

## Ron Richards

The Northern Tier project would be one of the largest oil port facilities ever proposed. The impacts and ramifications of such a project would be immense and far reaching. Considering the magnitude of the proposal, the D.E.S. that B.L.M. has published is totally inadequate. Deficiencies are so numerous that it must be considered an affront to the National Environmental Policy Act. The D.E.S. is so deficient that the County can only recommend that it be redrafted and resubmitted as a NEW DRAFT E.S. An in depth study of the document has revealed many erroneous assumptions and a general lack of credibility regarding the exact nature of the impacts relating to social, economic and ecological consequences of the oil port proposal.

The sections dealing with air pollution did not present full disclosure of the facts, and were generally biased. Air pollution impacts will be much broader and more wide spread than the D.E.S. alludes to. With the tremendous potential adverse impacts of air pollution on expansion and operation of our existing industries, further study with an improved data base is essential.

### WATER QUALITY

Data regarding geological and hydrological conditions and ground water pollution is lacking in the D.E.S. A more detailed description of the methods for handling of oily wastes and expected stream effluent quality from treatment equipment should be provided. Identification of wastewater sources and estimates of quantity and quality and discharge points are necessary. Chronic pollution could seriously degrade water quality of Port Angeles harbor and areas east of Port Angeles, possibly render the primary marine habitat non-productive, and would deprive residents and tourists of utilizing recreational opportunities in the harbor. Further attention to these concerns is mandatory.

### ECOLOGICAL SYSTEMS

The sections dealing with flora and fauna are also totally inadequate. The impacts are underestimated, and the full ramifications are ignored in the statement. Basic research is incomplete and overall, the sections lacked documentation.

### ECONOMICS

### AIR SHED AND EXISTING INDUSTRY

Our analysis reveals that the Northern Tier project would inhibit expansion of existing industry. Increased ambient air pollution levels curtail further discharges into the air shed and preclude further expansion or increased production of our mills. The D.E.S. is deficient in its approach to these problems.

### ENERGY AND EXISTING INDUSTRY

The D.E.S. is deficient in its treatment of Northern Tier's impacts on electrical energy availability. Here again, the importance of the problem is accentuated by its potential adverse impacts on expansion of our existing industries.

### TOURIST INDUSTRY

Availability of extraordinary recreation resources makes Clallam County a major tourist attraction. The D.E.S. does not provide a comprehensive assessment of the relative importance of recreation on the local economy and Northern Tier's impact on this. It is imperative that the economic value of lost recreation resources be quantified and it should be expressed in terms of employment, retirement immigration, value of goods and services and public revenue impacts.

### FISCAL IMPACT

The local government fiscal activity sections require considerable expansion to adequately assess the relative impact of the proposed action on local government expenditures and revenues -- especially as they relate to the cost of providing additional services which would be necessitated by the project.

CONT

### RETIREMENT

The loss in quality of life and increased costs of housing and property taxes due to the facility will discourage the growth of the County's substantial retirement community. This segment of population is very important to the County's social and economic fabric. The D.E.S. should elaborate on the oil port's impact in this area.

### FISHING

The D.E.S. does not offer any quantifiable data as to the economic loss to the fisheries from a worst case oil spill. The D.E.S. does not offer any baseline data to evaluate impacts on marine or aquatic resources. Again, such information is essential for a proper evaluation of the project.

### ENERGY NEED -- ENERGY QUESTIONS/WHOLISTIC APPROACH

The overall question of energy need is a most blatent example of the document's deficiencies. A federal[1] study has questioned the feasability of the Northern Tier proposal, and its findings should be further explored in the D.E.S.

### CONCLUSION

It must be stressed that all the primary impacts of the Northern Tier proposal are worsened by secondary impacts. To be complete, the D.E.S. must address impacts which would result from petroleum based industries that would follow Northern Tier; from the necessary support industries and other associated developments. The D.E.S. has again failed in this area.

Jim Falk, the County Planning Director, will speak of some additional deficiencies of the Draft E.S. and deal more specifically with the sociological impacts associated with the proposal.

## JIM FALK

### Fire Protection

No standards for fire protection of the storage facility are indicated. The D.E.I.S. does not indicate the fire protection procedures. A detailed design of an appropriate fire protection system for the terminal and storage facilities, based upon state-of-the-art methods should be detailed in the D.E.I.S.

### Transportation

1. There will be numerous construction subcontractors. It will be difficult to police them to see to it that they use designated routes and load limits are complied with. The D.E.I.S. should indicate specifically how subcontractors will be held responsible for compliance to performance conditions.
2. Alot of gravel will be used for pipeline construction. The D.E.I.S. should specify the source of this material and the impacts of extracting this non-renewable resource, including the possibility of increasing the cost of gravel in the County.
3. Construction traffic will exceed the capacity of the County roads which are used. This means increased road maintenance costs to the County. The D.E.I.S. should thoroughly address this matter, including appropriate mitigation.

### Engineering

1. The floating roof on the tanks and electric pump drives may be a risky way to contain hydrocarbon emissions. Other similar projects with floating roofs of the diameter proposed should be investigated within the D.E.I.S., especially in a seismic area.
2. Since the soils under the harbor's entrance are quite dense, the trench will need to be excavated by clamshell rather than by jetting as proposed in the D.E.I.S. The D.E.I.S. should be revised to address this concern.
3. The 300,000 ft./lb. pile driver will make a loud noise in the harbor, and it will be a significant nuisance to residents of the community during the construction period.

### Population, Housing and Land Use

1. Population

N.T.P.C. construction workforce estimates for the pipeline should be verified by an independent evaluation. They seem to be very conservative estimates. Normally, the labor costs of building a facility such as this is 25% of the total cost based on urban

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institute studies. The D.E.I.S. states that federal D.O.E. energy estimates that labor costs will constitute 6% of the $125,566,000 cost of the facility. If the D.E.I.S. is wrong and the workforce figure is substantially higher, then estimates of construction personnel and consequently local impacts might be seriously underestimated. The D.E.I.S. should more thoroughly address this area, giving appropriate documentation.

2. The D.E.I.S. does not accurately address the number of tanker crewmen and families who are likely to choose Clallam County as their home base. Clallam County is a very desirable place to live. Most crewmen and families will want to live here. The D.E.I.S. should be revised to address this.
3. There is very little information on the indirect population growth resulting from construction and operation of the facility. How many supporting services jobs will be generated by the primary employment related to the facility. The D.E.I.S. should address this matter thoroughly and provide documentation.
4. Documentation of all population estimates should be provided so that we can evaluate methodology. Relate facility growth induced growth with population projections without the oil port facility.

Housing

1. More information is needed regarding the specific nature of the "severe housing pressure" resulting from construction and operation of the port facility. The D.E.I.S. should relate anticipated incomes to type of housing demanded.
2. Land speculation and accelerated demand for housing induced by the construction and operation of the oil port facility will accelerate the price of housing. The increase will severely impact low income persons.

Land Use

1. The pipeline and tank farm are inconsistent with the County Shorelines Management Master Plan. The program designates the Green Point shoreline as a conservancy environment requiring non-permanent uses which do not substantially degrade the existing character of the area. The Master Program clearly states that industrial development ports are not permitted in a Conservancy environment. The D.E.I.S. does not adequately relate the project to the County Shoreline Management Program.
2. The tank farm and pipeline facilities are likely to attract related activities such as refineries or a liquified natural gas transshipment terminal. The D.E.I.S. should address this matter, including construction, operation and employment of a typical refinery that may be built.
3. The tank farm will impact surrounding land uses; (a) foster vigorous land speculation, (b) attract urban development, (c) land downwind of the tank farm will be devalued due to air pollution and may force residents to move elsewhere, (d) premature subdivision activity, lots created beyond need, wastage of land as lots sit idle for years, (the D.E.I.S. lacks this information), (e) local industries will be adversely affected due to the N.T.P.C. facility use of air shed capacity thereby limiting expansion of existing industries which rely on the use of the air shed, (e) oil spills will adversely affect log storage and ships transporting lots, and (f) consumption of harbor area by facility precludes use of that area by existing industries; log storage areas must be found on land. Dryland storage of displaced logs and associated impacts must be thoroughly addressed.
4. The pipeline corridor will eliminate considerable acreage from timber production. The D.E.I.S. should address the reasons why existing BPA right-of-way cannot be used instead of a new 90 foot swath of productive land adjacent to the BPA right-of-way.

Harbor

1. The facility will displace the Puget Sound pilot house, a boat launching ramp, salmon club facility and salmon derby activities. The D.E.I.S. does not adequately address the relocation of these activities. Mitigation measures must be specified in the D.E.I.S.
2. Strong east winds could disrupt oil containment booms circling the ships. The D.E.I.S. should address this matter.
3. Harbor usage and harbor traffic problems following terminal construction are inadequately addressed in the D.E.I.S. Mitigation measures should be proposed in the D.E.I.S. to solve problems identified.

CONT

We are unable to fully analyze consequences of this facility unless specific plans are provided in the D.E.I.S. relating to:

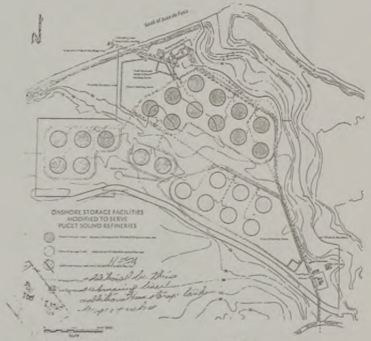
1) landscaping and grading plans
2) surface drainage plans
3) exterior lighting
4) erosion control
5) movement of construction vehicles
6) water supply and sewage disposal
7) facility construction plans
8) fire protection

Project Scope

The entire D.E.I.S. was much too hazy regarding the scope of the project to be evaluated. The following three project descriptions are contained in the D.E.I.S.:

Oil flow - 709,000 barrels per day = 11 storage tanks = 6 million barrels storage
Oil flow - 933,000 barrels per day = 18 storage tanks = 9.8 million barrels storage
Oil flow - 1,283,000 barrels per day = 20 storage tanks = 13.6 million barrels storage
(See diagram from D.E.I.S. on following page)

Also, N.T.P.C. proposes to lease the entire area south of the Coast Guard Station. This is more area than is needed by a 18 storage tank terminal. If the facility is intended to accommodate the latter description, N.E.P.A. requires the entire project be evaluated at this point by the D.E.I.S. The impacts identified in the D.E.I.S. appear to relate only to the 18 storage tanks -- 933,000 barrels per day oil flow facility.


N
Strait of Juan de Fuca
ONSHORE STORAGE FACILITIES MODIFIED TO SERVE PUGET SOUND REFINERIES
Scale

Source: Northern Tier Pipeline Company

Figure 7.
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B.L.M. SPEECH

REGARDING

DRAFT E.I.S.

SUBMITTED BY: DAVID R. BURNS ( County Environmental Coordinator )
As Official Response For CLALLAM COUNTY

I'd like to start out by saying that my primary responsibility working with the County is environmental review of projects, and a major part of my time is spent reviewing and occasionally writing environmental impact statements. Reviewing the B.L.M. Statement, I really appreciated the cartography involved in the document. It is apparent that B.L.M spent a considerable amount of money and effort to make the document attractive.

Had they spent as much money and effort in research and data collection, I think they might have achieved a worthy document. Unfortunately this doesn't appear to be the case. In all honesty comparing the Draft to the several dozens of E.I.S. reports I have reviewed, it is one of the worst documents I've seen considering the magnitude and importance of the project and the amount of research and study it warrants.

The most blatant liability of the Draft is it's failure to provide definitive answers. The entire text is filled with phrases like "probably", " the impacts are not known", "available data is insufficient", The most graphic example of this is on page 3-28, paragraph 10, where the author states " It is almost impossible to give a general discussion of such topics ".

This is totally unacceptable, an E.I.S. must, as mandated by law provide an analysis of impacts. A general discussion does not fulfill the intent of NEPA, a specific discussion is necessary and B.L.M. is telling us that they can't even provide a general discussion. I'm left with the very uncomfortable impression that B.L.M. has failed to do it's homework.

My specific role for the County in the review of this document was to head the Task Force Topic Commitees concerned with flora and fauna and wilderness area impacts. So, I'd like to spend the next 10 minutes zeroing in on some of the more specific deficiencies relating to the section of B.L.M. Statement concerned with ecological systems.

The general background information relating to migratory birds is inadequate. The magnitude of impacts will be immense and B.L.M. simply slides over the issue. The whole presentation is shallow and biased .

Paragraph 8, page 5-6 states:

> " Spills might attract these birds and it would be a significant local impact."

This is misleading. Impacts on bird populations will be of regional significance. Whole populations of water fowl could be destroyed depending on location, migratory bird movements and season of oil spills. Specific data relating to population distribution and migratory patterns is critical for proper analysis of this national resource.

On page 2-26, paragraph 9, the authors state regarding the Port, " No areas of special concern were identified." The Port itself is an important habitat for some bird populations. The statement is totally erroneous and fails to reveal the dramatic impacts that would result with the elimination of this habitat.

On page 3-35, paragraph 6, the authors state that Bald Eagles will be displaced; this is misleading. Bald Eagles may not be able to relocate. Where will they be displaced to? Elimination of habitat would more likely preclude that portion of the Eagle population. The statement also attempts to downplay Greenpoint as an Eagle habitat. Members of the Wildlife Commitee have been recording Eagle sightings and they've revealed that the recordings of B.L.M. are seriously low. Furthermore, page 2-26, paragraph 7, states no Bald Eagle nests have been sighted. This is probably erroneous because a possible Eagle nest has been located and a pair of Eagles has been seen frequenting the Greenpoint area. Further analysis of the situation is necessary.

Describing the entire pipeline route, page 3-84, paragraph 5, states a worst case analysis would have a possible 4 Eagle nests impacted. This is hardly a worst case analysis, but more realistically conservative estimate. B.L.M. further states that buffer strips could be left to mitigate impacts on nesting Eagles. This is a token effort. Eagles are a threatend species and a symbol of our national heritage -- areas with Bald Eagle nesting sites should be avoided.

Regarding marine systems, the statement again is inadequate. More attention should have been given to long term chronic exposure by minor spills and resultant contamination of marine organisms and resources. Sections dealing with the eelgrass beds do not fully disclose facts and necessary information for analysis. Eelgrass beds are a limited resource and are important in the dynamics of marine systems. Page 3-26, paragraph 2, shows definite weakness by stating eelgrass beds "should" be able to re-establish. This is inconclusive and deserves further analysis The section dealing with marine mammals is shallow and contradictory. Page 5-6, paragraph 9, states that seals should not be impacted by spills; then on page 5-17, the author states " little is known about the effects on seals." The statement also fails to adequately address the impacts of tanker traffic on marine mammal movements.

One example of a loss of credibility was a statement on page 3-84, paragraph 4, where B.L.M. stated an environmental inspector is proposed to accompany construction teams as a mitigating measure to insure that sensitive habitats are avoided. B.L.M. further states, " If that inspector were a botanist, areas with endangered floral species could be avoided." How can we be sure that the inspector will be a botanist? Who is to be the environmental inspector? The construction crew leader? Would he be qualified? Would there be one for every construction crew? Such statements appear as a token effort to downplay real impacts.

When discussing the enforcement of mitigating measures B.L.M. took the easy way out and stated, " No federal agency or state agency has committed to enforce specific mitigating measures." Then they further state that it is desirable to discuss such mitigating measures when recommending or issuing permits. This is horrendous, to exclude such a discussion is a terrible deficiency.

Another obvious deficiency was the referencing; many sections fail to list references and some references cannot be considered credible. Page 3-15, paragraph 7, for instance lists the N.T.P.C. as a reference regarding the length of time water quality may remain degraded after a spill. Other references included E.R.T., the N.T.P.C. private consultant. I would contend that Northern Tier information could be biased and I believe more credible references could have been sought. I had hoped the B.L.M. would have provided a more scientifically documented product.

In conclusion, I can only state that I am appalled at the inadequacy of the E.I.S. and I wish I had more time to elaborate on the multitude of other deficienies.

However, I will state that Clallam County will submit written testimony by the due date for such responses, and I can assure you that that portion of our response dealing with impacts to the ecological systems and resources of our County will be much more elaborate and thorough.

PRESENTED AT B.L.M. HEARING
ON MARCH 15, 1979.

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City of Port Angeles
TOURIST MECCA OF THE NORTHWEST
140 WEST FRONT STREET PORT ANGELES, WASHINGTON 98362

March 30, 1979

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Bureau of Land Management
Oregon State Office
729 NE Oregon Street
Portland, Oregon 97208

RE: Northern Tier Draft EIS

Gentlemen:

Enclosed is the official response of the City of Port Angeles to the Draft EIS on the Northern Tier Project.

This response does not include any comments upon the recent Northern Tier amendment to its application to the State of Washington, changing the route of the pipeline from around Puget Sound to cross-sound, and related amendments on bunker fuel storage and Green Point approach. Material on these changes has been but recently served upon the City, and no opportunity has been available to analyze that material. However, the Bureau of Land Management should assure that the Final EIS addresses the impacts of these changes, and that the public is afforded an opportunity to comment upon the discussion and analysis of these changes by BLM. Presumably, this would be through the form of a supplemental EIS, addressing the changes.

The discussion contained in the present EIS, in Section 8 Alternatives, can not be presumed to adequately address the impacts of the amendment. But eight pages of the impact statement are devoted to the cross-sound alternative in the existing impact statement. To rely upon the cursory treatment of the cross-sound alternative in those eight pages as sufficient compliance with NEPA on that portion of the project would be ludicrous. Rather, the cross-sound section of the pipeline, now a certainty should be analyzed in the same depth and to the same extent as all other portions of the project. Particularly, the oil spill risk analysis of the construction and operation of an underwater pipeline should be done in considerably greater depth.

This statement of the City of Port Angeles is based primarily upon the efforts of a volunteer study group, formed and funded by

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the City of Port Angeles and Clallam County. The information received from that group has been analyzed by the City, and converted into the form which is enclosed. The material prepared by the study group is being transmitted to you under separate cover. That transmittal encompases all material developed by the task group, while the present transmittal encompases the material considered by the City of Port Angeles to be of primary interest to it. The City takes no official position as to the comments of the citizens' group, which are those of the members of that group only.

The City looks forward to the treatment of its concerns and comments in the final environmental impact statement.

Very truly yours,

Kenneth S. Whorton

Kenneth S. Whorton
City Manager

Craig L. Miller

Craig L. Miller
City Attorney

KSW:CLM:pr
enc.

## Comments by City of Port Angeles on
## B.L.M. EIS
## Northern Tier Pipeline Company Proposal

The following comments on the B.L.M. Draft EIS are those of the City of Port Angeles, the site of the oil trans-shipment facility which forms an integral part of the proposal. These comments are directed to the adequacy of the statement, and point out a large number of areas in which the statement is deficient in its treatment of the environmental impacts on the City and environs. The comments are most specifically directed at the concerns of the City, as a municipal corporation and as a government of the people within its boundaries. There are some comments on areas not within the normal scope of activities and concerns of the City; they are included to show the breadth of the inadequacy of the impact statement.

As one of the two local governmental entitites which are most severly impacted by the proposal, these comments on the impact statement by the City of Port Angeles are voluminous. In the opinion of the City, these comments should be carefully considered by the BLM, and answers to these comments should be included in the final draft of the environmental impact statement. If that final draft continues the inadequate analysis of the draft statement as to impacts on local governments, it will be a seriously flawed document. Rather than addressing the specific, identifiable, and quantifiable impacts upon local government and local citizens, the statement will continue as a generalistic, under-specific and over-broad analysis of the impacts of a project of great size. The final EIS with these characteristics will not satisfy the requirements of the National Environmental Protection Act.

The comments of the City to follow are broken into two categories: (1) general comments as to the nature and emphasis of the statement, including comments on pervasive shortcomings of the draft statement; and (2) comments related specific sections of the draft. The general comments must be considered as applying to the entire impact statement, including sections of the impact statement which are not addressed and comments directed toward specific sections. Since the general comments are such the entire statement is flawed and inadequate in relation to those comments.

## General Comments on Draft EIS

### 1. Inadequate Presentation of Data

The material contained in the draft impact statement is not prepared in an easily understandable fashion. Data should be arranged in a manner which allows comparison of impacts which might be expected from growth and development without the Northern Tier Project, with impacts to be expected from the Northern Tier Project and related secondary development. The failure to present the data in this manner makes it extremely difficult to analyze the increase in impacts due to the Northern Tier Project, in areas of land use, housing, transportation, utility, and other public service impacts. This is particularly critical in the area of current population, as compared to projected populations with and without Northern Tier. Presentation of this data in an understandable manner would make a detailed analysis of socio-economic impacts much easier.

### 2. Failure to Provide Data for Assumption

Once again, addressing the area of socio-economic impacts, a major weakness of the material presented is the failure to present numerical values for some of the important relationships used to estimate population and employment impacts. As an example, the proportion of local workforce to total in-state construction employment is not indicated for Clallam County. The impact statement states the proportion is based upon a logrithmic formula, which appears to be arbitrarily selected. The local market share should rather be based upon local market conditions within commuting distances which data could be developed. The proportion of in-migrant construction workers with families - 48.9% - and family size - 3.61 - are based upon Old West Commission experience. While these figures appear reasonable, they could be tested against in-state experience of nuclear facility construction to determine their applicability to Washington. There is no reason to assume that indirect workers with accompaning families would be the same as construction workers. Rather the proportion should be similar to that of the population within the state, or approximately 89%. Similarly, family size should follow the level of the state, about 2.7 persons per family.

### 3. Failure to Adequately Analyze Construction Workforce

There is significant reason to suspect that the workforce projections contained in the EIS, which relate to all socio-economic impact sectors of the statement, are significantly under estimated. If one were to estimate the construction workforce on the basis of total project cost, assuming a total construction cost of the terminal, submarine pipeline, and storage facility at $125,566,000 - [illegible] share of 25%, average monthly [illegible] construction

CONT

period, the average number of man months required would be 581. This compares to an average of but 289 as shown in the DEIS. This is a significant factor of error which should be further analyzed. Applying this employment figure to the population relationship stated in the EIS, the average population would then be twice the projected levels, or 1050 per month over the eighteen month construction period. Peak month population levels would be as high as 2200, again using the relationships indicated in the DEIS. Results of this analysis suggest an alarming underestimation of potential socio-economic impacts resulting from construction workforce numbers located within Port Angeles and Clallam County. Further in-depth analysis of this is necessary.

Other sources of information on workforce requirements related to marine terminal and storage construction suggest a higher level than indicated by the DEIS, as well. An ERDA prepared typology of energy projects indicates a peak force construction of 1250, which is 2.8 times the peak force level shown for the first four months of construction in the impact statement. The New England River Basin Commission Project determined that the average construction workforce for marine terminals is 400 extending over a two-year period. These figures are based on construction of facilities with storage capacity of one million barrels as opposed to the six million barrels proposed in the initial phase of the Northern Tier Project. Even so, the workforce is one and one-half times the level reported in the impact statement.

The under-estimation of these construction workforce figures affects all discussions of environmental impacts resulting from an increase in local population due to an influx of construction workers. This is a critical problem due the broad scope of impacts on governmental services and the quality of life in the area which will result from these construction worker increases.

### 4. Failure to Consider Liklihood of Secondary Industry

The impact statement asserts that additional petroleum industry is not likely to be located in Port Angeles because of the existence of an oil port here. No documented rationale or reasons for this assertion exist in the impact statement.

Energy facility development is characterized by phase development, and full scale development is not always realized until completion of earlier phases. Discussion on refineries contained in the on-shore impacts of OCS Gas Development Source Book prepared by the Conservation Foundation lays out the principle factors influencing industry's decision to develope new refineries. They include:

(A) Nature of market
(B) Source of crude
(C) Production rate
(D) Land and water availability
(E) Environmental regulations
(F) Public opinion

An inspection of these six factors would suggest that Port Angeles might well be a prime candidate for refinery development in the future. Given that there are demands for additional refinery capacity on the West Coast, on a basis of the factors cited above, deciding characteristics of Port Angeles appear to be appropriate for refinery development.

When there is a definite possibility that additional petroleum industry may be attracted to the Port Angeles area through construction of an oil port, that possibility must be discussed, rather than being off-handedly discounted. A discussion of this possibility would cut across all aspects of the draft statement, and would involve impacts upon all areas discussed by the statement.

### 5. Failure to Consider Full Development of the Project

The impact statement discusses only two through puts for the port which is proposed to be constructed at Port Angeles: 709,000 and 933,000 barrels per day. However, the impact statement also specifically identifies the intention of the Northern Tier Pipeline Company, to expand the facility to 1,283,000 barrels per day, adding additional submarine pipelines, tank storage, and etc. The impacts from this stage of development, being an intent of Northern Tier, as expressed in the impact statement, should be discussed in the same detail as the impacts from the two smaller through put proposals.

### 6. Identification of Impacts Without Analysis

In many places, the impact statement acknowledges the existence of a probable or potential environmental impact resulting from the Northern Tier Project, but fails or refuses to analyze that impact to the extent required. Thus, the statement at one point identified that there might be a reduction in income of commercial and indian fishermen resulting from an oil spill, but failed to analyze that impact beyond the mere identification. In an impact statement, which is to disclose the environmental impacts, to adequately analyze them, and to form the basis for an informed decision as to whether the adverse impacts should be accepted, mere identification of impacts is simply unacceptable.

### 7. Over-reliance Upon Applicant for Input

As a final general comment, it must be noted that the impact statement, for whatever reasons, has substantially relied upon the applicant for information as to the impacts of its proposal. Certain conclusionary statements are made, based upon statements of the applicant and are not questioned by the authors of the impact statement. This appears to be inappropriate in a statement which is supposed to be neutral, and to not advance any particular interest. Information from the applicant may well be necessary and appropriate in a large number of situations. However, in an area where a probable environmental impact exists, and the applicant states that there is no impact, that comment from the applicant cannot be blindly relied upon. Rather, an independant investigation is warranted, to determine whether the applicant's statement of no environmental impact is appropriate.

## DESCRIPTION OF THE PROPOSAL

| Page | Section | Comment |
|---|---|---|
| 1-1 | 1.1 | The Northern Tier Pipeline Company (NTPC) is described as "a consortium of eight independent companies." In order to adequately assess the capability of NTPC to undertake the proposed system, information should be provided on the nature of the companies which form the consortium, including name and description of experience in oil marketing and transportation fields of each member company. |
| 1-1-1-4 | 1.2 | The discussion on supply shortage in the Northern Tier States indicates a shortfall of 600,000 to 700,000 barrel per day by 1985 and dependence on the Mid-Continental Pipeline to close this gap. The allegation of shortages of this dimension is not supported by the recently released (and preliminary) study conducted by the U. S. Department of Energy on current and future supply/demand conditions related to oil energy in the Northern Tier States. The DOE forecast crude supply shortfall is approximately 300,000 barrels per day by 1985. While it is possible that the DOE findings seriously underestimate the level of the shortage of crude oil faced by the Northern Tier States (NTS), potentially the NTPC could be forced to operate at far below its design capacity. It would be prudent, therefore, to require the NTPC to conduct market studies related to the sale of crude oil transported by the proposed system. Given the nature of the industry structure of refining and marketing in the NTS, such market analysis should focus on the Chicago area for a determination of demand conditions for crude oil carried by NTPC. Similarly, if the DOE forecast estimates withstand critical evaluation, it would be desirable to consider the potential for increasing the capacity of the Mid-Continental Pipeline system. |
| 1-10 | 1.4 | Off loading booster pumps are to be operated by electricity provided by Port Angeles Electric Utility. Until thermal power is available from the Washington Public Power Supply System, the City may have problems supplying the necessary electricity to operate booster pumps at the off loading facility. If electric supply is infeasible, NTPC may substitute gas turbine driven pumps for the proposed electric. This possibility should be developed further, as it would impact the natural environment (in pollution, noise) and result in the need for major fuel storage facilities. |
| Pa | Section | Comment |
| 1-10 | 1.4 | The few sentence superficial review of some of the fire protection facilities to be provided by NTPC as given here is inadequate, as there is not enough information given to even attempt to assess the magnitude of the fire protection problem, or the adequacy of the fire protection that is to be provided. In the discussion of these fire protection facilities to be provided, no mention is made of the standards that were used to determine what should be located, where it should be located, and other design factors incorporated into the fire protection facilities. |
| 1-10 | 1.4 | The location shown on the drawings for the diesel-driven fuel pumps near the booster pump platform is unsatisfactory, as it is exposed to damage in case of fire explosion. These pumps should be located ashore, in pits or other protected locations, as close to water level as possible. Two separate pump locations are necessary with separate suctions, controls and valves so either pump may operate independently of the other. Suction inlets and their maintenance in salt water present a special problem and must be carefully designed. Necessary pump capacity has not been discussed or detailed descriptions or locations of hydrants, fire mains, fire fighting chemical storage and locations and number of necessary fire appliances given. |
| 1-10 | 1.4 | Tugs and line handling launches supplied by private service companies for handling of tanker traffic should be required to have auxiliary fire pumps and monitors with foam capability. |
| 1-10 | 1.4 | The "fully equipped fire boat" referred to should be moored at a secure location away from the unloading pier, yet readily available. The size, pumping capacity, foam capacity, manning level and other equipment for this fire boat should be specified, and related to anticipated fire or explosion risks. |
| 1-10 | 1.4 | A description of bunker fuel unloading procedures related to the marine terminal operation is given, however, no address is made to the recently announced intention of Northern Tier to provide bunker storage facilities at the terminal facility. The inclusion of storage tanks for bunker fuel would have significant impacts in areas of safety, aesthetics, air quality, oil spill analysis, etc., and such should be thoroughly analyzed. |
| 1-10 | 1.4 | Statement mentions construction and use of a diesel-powered emergency electrical generator. Size of the generator and estimated frequency of operation should be given to permit evaluation of impact on air quality and noise level. |
| 1-10 | 1.4 | No discussion is presented on the source and type of energy which would be required in case a ship-load of oil required re-heating before it could be pumped through the pipeline system. |
| 1-11 | 1.4 | "Equipment to be kept on hand at this location would be determined during the development of the Spill Contingency Plan....". The purpose of the statement is to work out problems, but this quotation evades the basic questions related to such a plan:<br>1) Who develops the plan?<br>2) Who determines if the plan, manpower and equipment, etc., as designated, are adequate?<br>3) What recourse do those affected by the plan have if they do not feel the plan is adequate? |
| 1-11 | 1.4 | The statement: "Semi-permanent oil booms would be installed between ship and shore." Questions arise as to the effectiveness of these booms, particularly "worse case" weather conditions, the disposition of oil contained within this boom, the effect of evaporation and dissolution of oil contained within these booms prior to any possible cleanup, and whether this implies a permanent area of contamination within the harbor. These questions are not addressed. |
| 1-11 | 1.4 | The statement says, "NTPC will provide a skimmer recovery vessel for more dispersed spills." Is evidence available to demonstrate that a skimmer recovery vessel is effective in regard to dispersed spills and does this effectiveness continue in extreme varying weather and tide conditions. |
| 1-11 | 1.4 | The statement says, "For a large catastrophic spill the services, equipment and expertise of the Clean Sound Cooperative would be used." Further information must be provided as to the capabilities of the Clean Sound Cooperative, specifically directed to techniques used, response time for manpower and equipment to the Port Angeles area, including response time in severe weather conditions. The manpower and equipment of CSC should also be specified, and related to the possible oil spill situations which might occur. |
| Pa.. | Section | Comment |
| 1-15 | 1.4 | Fire protection systems for the storage facility are indicated. However, no standard of fire protection for this type facility is mentioned. The statement also indicates that fire protection procedures and detailed design of protection systems have yet to be developed. Given the potential hazards, development of an appropriate fire protection system for the terminal and storage facilities, based upon state-of-the-art methods, should proceed at once as a pre-condition of approval of the project. |
| 1-40 | 1.4 | The statement indicates that the terminal dispatcher will advise the tanker which anchorage area to occupy. There is no discussion of possible location of anchorage areas in the statement. Anchorage within the harbor itself is limited, due to present traffic and present anchorage of vessels. |
| 1-50 | 1.4 | Nothing is said about any arrangement to guarantee funds to pay for abandonment and disposal when the time comes. A statement of financial position of NTPC consortium members is not enough. A trust fund (or the legal and financial equivalent) should be established to guarantee sufficient dedicated funds to pay for proper disposal. |
| 1-50 | 1.4 | The statement says, "terminating operations would lead toward abandonment and possible disposal of all or portions of the entire system". The word "possible" in that statement is too vague. If operations are terminated, the system should be disposed of as directed by some appropriate authority. Additional information is required as to what will happen if and when operations are terminated. |
| 1-53 | 1.4 | The statement refers to a cost analysis conducted by DOE in which installation labor is not expected to exceed 6 percent of total cost. As a practical rule of thumb, construction labor represents approximately 1/4 of total costs for major industrial projects. This discrepancy is significant, for two basic reasons: 1) the financial integrity of the project might be called into question and 2) estimates of number of construction personnel and consequently local community impacts might be seriously underestimated. |
| 1-56 | 1.4 | The discussion on additional measures proposed for environmental protection indicates NTPC's decision to station a manned fire boat at the marine terminal and fire truck at the storage facility. Additional information is needed on whether the fire boat and truck will be turned over to the municipal authorities, or operated privately by the company. If the latter is decided, information should be provided concerning the restricted use of the equipment. Clarification should be provided on whether the manpower requirements related to fire protection of the NTPC facilities are included in the calculation of total permanent personnel figures. |
| 1-56 | 1.4 | The statement indicates that the NTPC will establish procedures for assuring in-port use of low-sulfur bunker oil. Since the use of low-sulfur bunker oil is assumed in estimating air pollution impacts of the terminal facility, the legal basis for assuring that only low-sulfur bunker oil be used in tankers calling at the terminal facility is to be determined and outlined. |
| 1-.. | 1.4 | The statement discusses procedures regarding establishment of plans for meeting local labor and housing demands associated with the construction phase of the marine terminal, storage facilities and pipeline. Since employment conditions and, especially housing, are of paramount concern to the communities within the impact area, information on this impact should be provided, including estimates, as part of assessing the impacts of the proposed action and not wait until approval of the project. |
| 1-59 | 1.5 | Statement says, "there would be no significant effect on endangered or threatened marine mammals". However, it does not appear that worst case impacts of oil spills, fires or explosions have been considered in making that statement. Further, have these impacts upon bald eagles which are noted to have a roosting area at Green Point, been analyzed. What is the applicability of the Bald & Golden Eagles Protection Act, 16 U.S.C., Section 668-668d? |
| 1-62 | 1.4 | The statement briefly describes the alternative Kitimat Pipeline Proposal, in which it is stated that a recent study of Canadian crude oil resources concluded that heavy crude oil development in Canada eliminates the need for a West Coast Transhipment point. A major reason for the proposal is the shortfall of oil to the Northern Tier States resulting from Canadian Oil Curtailment. The conclusion of the above study tends to contradict this assumption. Therefore, this study should be examined as part of assessing the overall need for the proposed pipeline system. |

## DESCRIPTION OF THE ENVIRONMENT

| Page | Section | Comment |
|---|---|---|
| 2-5 | 2.1 | The statement says that data on sulfur dioxide levels is of poor quality. Since 1974, the Washington State Department of Ecology has monitored sulfur dioxide levels in the vacinity of the ITT Rayonier plant in Port Angeles. Reference should be made to this data, and also to the fact that the Environmental Protection Agency questions this data. Further, no data does presently exist on nitrogen oxides, carbon monoxide, or ozone in the Port Angeles area. The absence of base line data on these subjects makes it difficult to determine the relative impact of the Northern Tier Project on air quality in the Port Angeles area. This issue has special importance to the economic life of the Port Angeles/Clallam County community, because the potential impact of air quality changes on major local manufacturing industries, both in terms of maintaining present production and employment levels, and in terms of possible future expansion of their facilities. |
| 2-22 | 2.1.1.7 | The statement says "Some commercial and sport fisheries are found in the western strait . . . ." this is misleading, as fisheries are important to the Port Angeles area, worth approximately $5 to $6,000,000 annually. |

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CONT.

2-22 2.1.1.7 The statement that there are no endangered or threatened mammals found in the Strait of Juan de Fuca is incorrect. Grey whales are not rare in this area, and are observed annually as far into Puget Sound as Hammersby Inlet. They come into bays and harbors to feed and/or scrape off parasites.

2-22 2.1.1.7 No mention is made of sea otters which are found in the Straits and are a threatened or endangered specie. According to Estes and Palmisano, 1974, 1060 and Kerr 1975, 50, game authorities have introduced otters to Washington and Oregon coasts. The previous domain of the sea otter was the entire length of the West Coast including the Strait of Juan de Fuca. Sitings on the Straits of sea otter have occurred.

2-26 2.1.1.9 The port proposal is an area of special concern, due to the use of the port as a habitat for migratory birds.

2-28 2.1.1.12 The statement provides but a brief discussion, including a map delineating the land use of the Port Angeles area, of base-line land use practices and policies within Port Angeles and Clallam County. However, the statement should include substantive information on the following points:

2-28 2.1.1.12 (comment, continued)

(a) land use planning goals and policies adopted by the communities (The comprehensive plans of both Port Angeles and Clallam County contain prohibitions against the development of a major oil port and storage facility. No specific reference to these significant policies is made.);

(b) consistency and compatibility of the proposed project with adopted land use plans and policies;

(c) provisions of Clallam County Shoreline Master Program with respect to potential impact areas;

(d) consistency and compatibility of the proposed project with the Clallam County Shoreline Master Program;

(e) issues involving the legal affect of local land use plans and policies (including the provisions of Clallam County Shoreline Master Program);

(f) land use goals and plans of the Port Angeles Harbor District;

(g) specific data on scope of residential development already planned in the area adjacent to the crude oil storage facility and:

(h) land use policy implications of large-scale temporary housing requirment for construction workforce.

2-31 2.1.1.12 Several recreation areas have not been included in the map, including Striped Peak Recreation Area on Freshwater Bay, city parks within Port Angeles, the Olympic National Park Visitor Center, and the portion of the Park included in a ten-mile radius of the tanker berths, and one section of the Dungeness Recreation Area and Wildlife Refuge.

2-32 2.1.1.13 While it is noted that there is regular ferry service to Victoria, British Columbia, this is not documented in table 2.1.1.13-1.

2-32 2.1.1.13 Under Section 2.1.13, and also 3.1.13 there is a discussion of the utilities and transportation network. Excluded from both these sections is a description of the solid waste utilities and a discussion of the impact of the project upon solid waste. Among the concerns that must be addressed are:

A) Identification of the types, sources and estimated quantities of solid waste that will be generated during the construction activities and during the operation phase.

B) A description of how solid wastes which are not compatible with any existing landfill will be handled.

C) A description of protective measures to be taken to prevent contamination of ground water by solid waste.

D) Assuming a major oil spill, a description of how the wastes resulting from cleanup of that spill would be handled.

E) The effect of increased population growth, both during construction and operation phase of the project, on available solid waste disposal facilities.

2-32,
2-36 2.1.1.13 While the statement discusses the existing road and highway networks in the Port Angeles area, considerable expansion on that discussion is required in order to establish a baseline against which to compare Northern Tier Project impacts.

Figure 2.1.1.13-1 provides annual average daily traffic (ADT) figures on selected road segments for the Port Angeles area in 1976. The analysis should be expanded to include roads which are likely to be impacted by project related residential as well as construction traffic. In addition to ADT figures it should include peak hourly volume traffic figures, in order to provide a reasonable comparison with road capacity values (design hourly volume - DHV). These data should be provided for peak seasonal volume (summer) as well as annual average traffic.

The traffic growth factors indicated in the environmental statement for the Port Angeles area appear too low, even assuming relatively low population growth rates in the future. Traffic can be expected to grow at a fairly high level for several reasons: increases in population, increases in tripmaking per household brought about primarily because of increased auto ownership, and increased tourism/recreation travel.

The statement contains information on service levels for a limited number of road segments. The discussion should take into account City and County road managment plans and policies. The comprehensive plans for both governmental units indicate a high priority for improving traffic circulation.

The DEIS does not mention the existence or lack of a public transit system or the communities' plans and policies in that regard.

Finally, as part of baseline data on transportation, the statement provides information on the condition of highway and County and City roads in regard to potential heavy

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truck loading associated with the proposed project. Such information should indicate type of road, road weight capacity, and level of maintenance for segments likely to be affected by construction of the proposed project.

2-35,
2-36 2.1.1.13 Statement provides information on electric transmission capabilities in the Port Angeles area. The discussion recognizes the difficulty of forecasting power supply in the region. Availability of electric power to Northern Tier is determined by several factors:

A) Bonneville Power Authority (BPA) allocations under current contracts.

B) BPA allocations after expiration of current contracts.

C) Availability of nuclear power from WPPSS.

D) Accuracy of local forecast by City and County.

Present and forecasted electrical loads for the City and County are shown, based upon ERT estimates. Relevant dates do not accompany the forecasted loads. This should be corrected.

Since a future power shortfall is clearly a possibility, NTPC could reduce its electric power demand substantially by adopting gas turbine-driven booster pumps at the the marine terminal for oil off-loading operations. This alternative should be considered in the impact assessment process, because of the implications for air quality, noise, and land use, this latter due to fuel storage requirements associated with turbine pumps.

No information is provided as to the legal requirements on local utilities regarding electrical power deliveries to energy transportation projects. Reference to specific citations of law and relevant court opinions on this issue should be provided.

Presumably, under existing Washington State law NTPC would not be subject to interruption of electric power. Therefore, almost certainly there would be times when other power customers, including residential customers, and businesses and manufacturers (not enjoying non-interruption protection) would be subject to interruption, with potentially severe consequences. According to the statement, critical water year situations affecting power availability occur one year in ten. The potential impacts of such an occurence, given heavy power demands on the part of NTPC, should be given consideration. The heaviest impacts would probably fall on heavy manufacturing, i.e., the paper and plywood industries, which are major employers in the Port Angeles area. An extended period of power interruption to these industries might result in a substantial drop in employment, income, and municipal revenues, and a consequent increase in public service outlays.

The statement does not discuss the effect of power demands of NTPC on local area rates. Reasonable concern could be voiced about the effect heavy power demands might have on the community rate structure.

Incremental pricing appears feasible, and accordingly the electric utility authorities intend to price power provided to NTPC at thermal rates (which reflects incremental cost to utility of purchasing power from WPPSS).

2-35 2.1.1.13 The statement implies that a new 69 KV transmission line from the base of Ediz Hook to the unloading dock will be required. Neither a description of the line (overhead, underground, or submarine) nor a discussion of its impact on the Hook's stability and use is given.

2-36 2.1.1.13 Uncertanty over future availability of electrical power to supply the needs of Port Angeles City Light and Clallam County PUD even without the substantial requirements of NTPC is cited. Discussion of the impact, both short and long term, of limited electrical power on the area is

2-36 2.1.1.13 The availability of thermal power from WPPSS as described in first paragraph on Page 2-36 is incorrect, since all five nuclear power projects have had rescheduling of target dates for commercial operation.

The new dates for commercial operation of the five nuclear power projects are as follows:

WNP-1 - December, 1983
WNP-3 - December, 1984
WNP-2 - September, 1981
WNP-4 - June, 1985
WNP-5 - June, 1986

(taken from WPPSS News Release No. 79-13, 1/26/79)

2-36 2.1.1.13 Table 2.1.1.13-5 describes Port Angeles City Light and Clallam County PUD's present and forecasted loads but it does not state which years the forecasted load is predicting.

2-37 2.1.1.14 The number of passengers carried to and from Victoria on the Ferry COHO should also be listed, including high and low figures.

2-37 2.1.1.14 Statement shows a picture of the Olympia National Park Visitor's Center, but does not mention its proximity to Port Angeles nor its location within three miles of the Northern Tier terminal. No mention of the National Environmental Study Area which is adjacent to the Visitor's Center and which was used by 7500 persons in 1978 is contained within the statement. There is no mention of the fact that the Visitor's Center offers a view of the harbor. There is also no mention of the 174,386 visitors to the Visitor's Center in 1978. The Hurricane Ridge location within the park offers views to the north, as well as into the Olympic Mountains.

2-36,
2-38 2.1.1.14 The statement presents a brief description of available recreation resources together with some indication of human utilization of those resources. It does not, however, provide a comprehensive assessment of the relative importance recreation has for the local area economy especially with respect to tourism, a local growth industry.

Availability of extraordinary recreation resources makes the Port Angeles area a major tourist attraction. The natural environment offers opportunities for a variety of recreation activities found in few places in the country. Boating, sport fishing, beach combing, climbing, hiking, sight seeing, to mention a few activities, are available

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to the local residents and visitors alike. Recent growth in the non-manufacturing sector of the area economy reflect the increasing importance of recreation and tourism.

Moreover, Clallam County has been "discovered" as an ideal retirement community by people across the nation. In recent years retirement related in-migration to the area has been heavy. Obviously, the recreation opportunities afforded by the area contribute to this phenomenon. Therefore, preserving this major resource is a major concern of the community in regard to the potential impacts of the proposed oil port facilities.

There are a number of socio-economic variables to be considered in developing a baseline source of information for assessing the impact of the NTPC proposal. But first it should be understood that the tourist industry is classified as a primary or basic industry. This means that income generated from tourism not only increases the employment base in that industry, but through the income-expenditure stream of the local economy will stimulate employment in the service sector or non-basic industry (this is commonly called the multiplier effect). The same relationship applies to the income generated from retired in-migrants. Income received from annuities, pensions and government transfers by retired in-migrant households creates a demand for goods and services, resulting in secondary employment growth. The foregoing points are important to understanding the importance of the recreation/tourist/retirement related industry to the local economy.

Some of the important baseline economic variables include: the number of visitors each year and average length of stay; average visitor expenditure per day; number of non-resident vacation housed constructed and average value of residence; employment and payrolls in tourist related industry. Information of this sort should be provided (if possible) over a period of several years in order to develop a growth profile of the industry. As one source of data on employment and wages, the Department of Employment Security published annually and quarterly Employment and Payrolls in Washington State By and County and By Industry.

Because certain recreational facilities on Ediz Hook stand directly in the way of proposed oil port, i.e., the Salmon Club Boathouse and public landing facility, they should be clearly indicated on a map included in the environmental statement.

2-38 2.1.1.15 As a general comment on the entire section, it should be noted that, in describing the current social and economic conditions existing in Clallam County, this document expresses (p. 2-46) a need for a more diversified industrial base and for additional jobs to stop youth-out migration. Yet the document omits any mention of the Clallam County Overall Economic Development Plan - a current plan, updated annually by a committee of more than 25 local business leaders working through the Chamber of Commerce. The goal of the plan is to "identify and set priorities to projects and programs that will reduce the County's unemployment rate." The 1978 plan lists 18 short-range projects, 8 mid-range and 8 long-range projects, all of which could help the County reach its economic goals without the risks associated with an oil port. Therefore the BLM statement of current social and economic conditions is incomplete.

2-38 2.1.1.15 While information on vessel activity in the Strait of Juan de Fuca is provided, the statement does not provide data on vessel activity within Port Angeles Harbor. Both existing and projected future vessel traffic related to harbor use should be provided. The harbor also services as a refuge for in-transit vessels as indicated by the statement. Information on present anchorage capabilities and utilization rates for this purpose should be provided. A discussion of potential and planned future harbor uses should be provided in the environmental statement.

2-39 2.1.1.15 Why was a table similar to that for commercial fishing in Canada not provided for the area between Port Angeles and Port Townsend.

2-[illegible] 2.1.1.15 Baseline information concerning population is incomplete and poorly presented. Population trends by age groupings for Port Angeles are presented in a graph (Figure 2.1.1.15-1). However, this information is largely meaningless, because absolute population values are not shown. Population distribution by age is shown for the decennial year 1940 through 1970 (total population for 1976 is given) for Clallam County. No population figures for Sequim are shown.

In order to adequately assess the impact of the NTPC proposal additional population information is needed. The information should be provided on the three major jurisdictions most likely to be impacted by the proposed project: Port Angeles, Sequim and Clallam County. The required data include: total population, population by age, sex, ethnic background. The data should be arranged to reflect growth patterns, including overall rates of growth and the make up of the population. With reference to the latter, recent population trends indicate an increasingly high proportion in higher age brackets, this is a reflection of heavy retirement in-migration to the area. In addition, forecasted rates of population growth should be a part of baseline information. Population forecasts are necessary, inter alia, for making comparisons of the relative impacts of the proposed action on public services and revenues.

2-41 2.1.1.15 The statement supplies a breakdown of employment in Clallam County for 1975, including the annual average unemployment rate for that year. This information should be updated to reflect current conditions where possible. Employment data by industry is available in Employment and Payrolls in Washington State By County and By Industry, published quarterly by the Employment Security Department, Washington State. Generally there is a nine month lag in the publication of this data. Current unemployment rates are available monthly from the Department's local area employment offices.

Because of the NTPC's stated determination to hire construction workers locally, as part of mitigating the impact of the construction phase, information should be made available on the existence of local union labor halls in the Port Angeles area, including a list of the union occupations that are represented. In addition, an occupational profile of the current labor force should be provided in order to determine the availability of labor with appropriate skills in the area. This may require an on-site survey, as comprehensive occupational data is typically available only from the decennial US Census.

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2-41 2.1.1.15 The section on local government fiscal capacity requires considerable expansion in order to be able to assess the relative impact of the proposed action on local government expenditures and revenues. Fiscal data should be provided for all local governments and taxing jurisdictions in the impact area, i.e.; Clallam County, Port Angeles, Sequim, and affected school and junior taxing districts. This data should consist of revenues by source for 1977 in each jurisdiction. Since the property tax is a major component of local revenues for most jurisdictions, detailed information on assessed valuation, levy rates, taxing limitations with and without voter approval, and bonding capacity should be covered. Special limitations on the revenues base, such as the 106 present limitation on county and city governments imposed by the state, or the potential loss of the forest yield taxes to the County due to diminished state timber sales, should also be discussed.

2-42 2.1.1.15 The housing section needs expansion. Additional data should be provided for the major impact areas - Port Angeles, Sequim and Clallam County (unincorporated). Data requirements concerning general housing conditions include:

(a) Population in dwelling units
(b) Owner/renter split
(c) Vacancy rates by type of dwelling unit
(d) Housing trends by structure type
(e) Building permits (recent years) by location
(f) Housing assistance needs of lower income households
(g) Special housing - motels, hotels, boarding houses

In addition, recent housing cost data should be supplied covering average single family housing valuation, average cost of new construction (single family), rental values by size of unit, and average annual inflation rate (recent years) related to housing values and rents. Since, housing demands associated with construction of the proposed project are likely to result in sharply increased housing costs (especially for rental units), the EIS should provide comparative information on the experience of other areas of similar size and geographic isolation which have been impacted by construction projects of the type proposed.

2-42 2.1.1.15 With respect to schools, information should be supplied on each of the school district lying in the impact area: Districts No. 121 (Port Angeles), No. 313 (Crescent), and No. 323 (Sequim). Baseline data should include:

(a) Enrollment by grade profile (current year and historical);
(b) Current year pupil/teacher ratios by grade;
(c) Physical capacity designated as either standard or substandard as determined by the State Superintendent of Public Instruction;
(d) Enrollment projections and capacity projections.

2-42 2.1.1.15 Baseline water supply information should be supplemented with detailed summaries of the water systems likely to be impacted by the proposed facilities and related populations. At a minimum the information should reflect the following general system characteristics: type of system, source of water capacity, number of connections by type, current average and maximum usage (gallons per day), maximum capacity and unused capacity. In order to estimate potential financial impacts, information regarding customer water rates, connection charges, and capital financing should be included.

Given the potential heavy demands on the Port Angeles water system related to supplying potable and ballast water to ships-in-port, data on current use and capacity of the water line on Ediz Hook is required.

2-44 2.1.1.15 Wastewater baseline information related to the City of Port Angeles should be supplemented with a discussion of sewerage system likely to be impacted in the County and City of Sequim. The discussion should consider peak and average capacity, (gallons per day) peak and average flows, and plans for system improvements and expansion. The Port Angeles system does not provide waste treatment for industrial wastes, hence a discussion of available methods of treatment for industrial wastes, hence a discussion of available methods of treatment of industrial waste is needed. Finally, information should be provided on user fees, connection charges, and capital financing for each sewerage system under consideration. This is important for assessing financial impacts of the proposed facility on community services.

2-44 2.1.1.15 Solid waste is not discussed by the statement. Potential construction wastes related to NTPC project are large. Hence baseline information on the location and capacity of solid waste sites is important. Moreover, during operation phase the facility is likely to generate solid waste substances which may be incompatible with solid waste capabilities in the area. Therefore, a discussion of absorption capabilities of existing sites should be indicated.

2-44 2.1.1.15 Baseline information of fire protection in the DEIS is limited in scope. It should be expanded to include detailed inventory of fire fighting and emergency vehicle equipment, manpower, training, activity levels (including response times) and protection status/population served, property type and valuation in service area, and fire insurance grade for each department or district likely to be impacted by the proposal. The discussion should indicate the location of station, general condition of equipment, and plans for improvement and expansion to upgrade capabilities or meet the demands from population growth. Since independent fire districts are self-financing, information concerning current financial structure, including method of capital financing, tax rates, tax limitations and tax base, is needed to assess financial capability to absorb increasing demands related to the proposed project. The information base should also indicate state average service levels in terms of fire protection for similar size communities.

Police protection information should be supplemented with the inclusion of data on crime patterns in the county. One source of information for this data is the FBI Local Crime Reports. Data on manpower, equipment, facilities, and manpower/population ratios should be presented for each department (County Sheriff, Port Angeles Police Department, Sequim Police Department, State Highway Patrol). The information base should also indicate state average service levels of police protection for similar size communities.

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| 2-44 | 2.1.1.15 | Medical services information contained in the DEIS needs expansion in order to determine service standards and capability to meet health care demands associated with the project. Information should be provided on the following items: number of primary care physicians; ratio of primary care physicians to population; utilization rates (number of patient care days per thousand population); state standards regarding facilities for specific treatment, including alcoholism; comparative service levels based on communities of similar size and character; and local public finance of medical services. |
| 2-44 | 2.1.1.15 | Community service discussion on the DEIS should provide detailed information on types of services provided by relevant agencies, utilization rates, manpower and facility capacity and funding sources. In addition, information concerning availability of services in connection with day care facilities, service to elderly and services to low income people should be provided. Service capability with regard to the latter is especially important as the percentage of low or marginal income people may rise significantly during construction of the proposed facility as those persons are attracted to the area looking for work. The number of low income persons seeking help will undoubtedly increase along with competition for services, for which funding may not increase. |
| 2-44 | 2.1.1.15 | The section on amenities in the DEIS needs considerable expansion, especially concerning municipal park facilities and library service. Park information should include data on number of parks and acres/1000 population and financing for each jurisdiction. Information on library service should include current and historical information on books and materials budget, size collection, circulation and financing mechanism. |
| 2-46 | 2.1.1.15 | The second paragraph totally underestimates tourism, by commenting: "thousands of tourists come to the area each year . . ." Usage figures for Olympic National Park indicate there were over three million visitations to that facility in 1978. |
| 2-154 | 2.2.1.2 | The statement says "according to the Olympic Air Pollution Control Authority, no new major industry is expected in the near future." The question arising from this quote is what expertise the Air Pollution Authority has to make this type of determination. This section further states that overall air quality is expected to remain at present levels. Since this section of the document is to deal with conditions through the year 2000. This statement appears to be overly broad. |
| 2-156 | 2.2.1.15 | In discussing the future environmental conditions, the document leaves out any mention of short, medium and long-range projects for development of the area as proposed in the Clallam County Overall Economic Development Plan of 1978. Further, the general statment that "The principal industries of the local economy are expected to continue to grow" is hardly a sufficient description of the economic climate to be expected through the year 2000. |
| 2-162, 2-163 | 2.2.2.13 | Under "Electric Transmission" on page 2-162 it states that Table 2.2.2.13-2 shows the P.N.U.C.C. West Group Forecast of power loads and resources for March 1, 1978. Table 2.2.2.13-2 on Page 2-163 shows only probability of power insufficiency for forecasted years. |

### Impacts of the Proposal

| Page | Section | Comment |
|---|---|---|
| 3-1 | 3.1.1 | The statement that there will be no significant impacts on climate ignores effects on climate which will occur as a result of the air pollution resulting from the oil port. For example, the Sequim climate is distinctive enough that much of the area has been developed because of the low precipitation rate and the increased sunshine. |
| 3-2 | 3.1.2 | The construction phase pollutant emissions ignores the fact that downtown Port Angeles is presently a nonattainment area. The statement does not speak to the problem of how men, material, and equipment can be transported through Port Angeles to the marine terminal site, without creating a significant further deterioration of the City's downtown air quality. |
| 3-2 | 3.1.2 | No baseline data has been presented in the discussion of either construction phase or operation phase air pollution as to the number of people with respiratory problems who might be affected by pollutants either from construction or operation of the oil port. |
| 3-2 | 3.1.2 | State, local and federal air quality standards are not mentioned at any point during the discussion of construction pollution omissions. |
| 3-2 | 3.1.2 | There is no discussion of the impact of the amounts of water which will be necessary at all construction site to hold down the fugitive dust omissions. |
| 3-2 | 3.1.2 | The statment indicates that no mathmatical modeling studies were done to obtain quantitative estimates of air quality impacts during construction. Significantly, while provisions of the Clear Air Act Amendments of 1977 may exempt transient construction activities, as to their contribution to allowable air quality increments, there is no exemption for ambient standards. This should be particularly addressed to both carbon monoxide and nitrogen oxide emissions. The models used to determine air quality impacts should also address the situation resulting when whether conditions have prohibited unloading of tankers for significant period, and large numbers of tankers await unloading. During high winds and other severe storm conditions, it is to be anticipated that unloading will not occur. Rather, tankers will have to wait until those high wind conditions have abated, and then all waiting tankers will have to be unloaded as rapidly as possible. The use of high winds as part of the modeling is thus inappropriate. |
| 3-4 | 3.1.1.2 | The statement does not discuse possible mitigating measures, either here or in the mitigatory section, which might decrease the amount of tanker stack emissions. Among those that are possible are:<br>1) have a bonnet over the stacks of the tankers and process the gasses through scrubbers, bag houses, precipitators, catalytic converters or whatever is necessary to remove pollutants;<br>2) have flu gas monitors to insert into tanker stacks to measure pollutants. |
| 3-4 | 2.1.1.2 | The statement does not indicate that Olympic National Park, as a class 1 air quality area may not have its air quality affected. |
| 3-4 | 3.1.1.2 | Why was not the true worst case analysis performed. The possibility exists for three 300,000 dead weight tankers to be unloading simultaneously, under the adverse weather conditions. These impacts should be discussed and modeled, so that the true effect of the project upon air standards public health, public safety, and other factors may be accurately analyzed. If this is not done, the statement is misleading. |
| 3-4 | 3.1.1.2 | Since there are no standards stated by the applicant which would make it an enforceable obligation of all tankers that 1.0% sulfur or less be used by all vessels, why were not studies made using the sulfur content of normal bunker fuel in tankers. It must be presumed, that until such time as enforceable measures are forthcoming, tankers using all types of sulfur content in their bunker fuel will be allowed to use the port. |
| 3-6 | 3.1.1.2 | The rationale for worst case for tanker hydrocarbon emissions overlooks several factors. Among those are the fact that the worst case hyrocarbon emissions would be during an oil spill rather from ballast emissions. Further, purging is not considered. While it is stated that purging will not be done in port except in an emergency, that situation should be analyzed, as it must be presumed, for full disclosure, that such an emergency might occur. Further, the distance that a vessel will be required to travel from Port Angeles before purging will be allowed should be discussed and the impact of that analyzed. |
| 3-7 | 3.1.1.2 | The selection of a Reid Vapor Pressure of 4.0 per square inch negates all computations for hydrocarbon emmissions, both tanker and tank farm. There is ample documentation demonstrating 8 - 12 psia as a typical Reid Vapor Pressure. These figures should be used rather than the low figure chosen. |
| 3-7 | 3.1.1.2 | If omissions in the abandonment phase are similar to construction, then the same analysis of those impacts which was required for construction should also be performed. |
| 3-7 | 3.1.2 | In the section on visibility, the statement says that "The effect on visibility in the Olympic National Park would be evident only to an observer on one of the ridges . . ." This is in error. The Park Visitor Center located three miles from the oil unloading facility would be affected. The view from the front lawn is currently unobscured, but would be affected. The statement is further generally condescending, and slights the value of visibility to Olympic National Park. Thousands of visitors drive up to the Ridge each month of the year for the express purpose of enjoying the views northward. |
| 3-8 | 3.1.2 | There is an overall positive correlation between the air quality impacts described herein and economic conditions which has not been discussed. Both major industries sectors, manufacturing and tourism, are sensitive to air quality changes. Air quality is important to local manufacturing because of stringent government regulations which result in higher capital and operating costs, and which reduce the return on investment. Expansion of the economic base associated with this sector might be out of the question, when the air quality in fact of the Northern Tier proposal is tacked onto existing problems. Indeed, reductions in existing production and employment might occur. Air quality impacts on tourism are extremely difficult to quantify. Nevertheless, poor air quality conditions would adversly affect the attractiveness of the area to visitors. |
| 3-2 to 3-8 | | The analysis throughout this section focuses on air quality impacts associated with construction and operation of up to a 933,000 barrel per day through put system. There is no analysis of the larger system, nor of air quality impacts which might be associated with the following possible further developments after the Northern Tier project: (a) possible alternative uses of turbine powered booster pumps at the off loading terminal; (b) possible reduced energy related industrial development, including refineries; (c) possible expansion of the local manufacturing industry. |
| 3-8 | 3.1.3 | This section does not consider the possible alternative use of fuel driven booster pumps at the marine terminal. Because of possible constraints on available electricity, this alternative may be seriously considered by Northern Tier, and in considering that use, the noise level which will be created by those pumps must be considered. |
| 3-12 | 3.1.4 | The statement says "a large magniture seismic event exceeding design criteria could occur; however, based on historical records the probability of such an event occurring during the life of the project seems quite low." Historical records referred to are not defined as to time, region, or other perimeters. The probability of a large earthquake is not quantified, howevever, if probability is sufficient to merit comment, then the design criteria might require re-evaluation to deal with that eventuality. |
| 3-14, 3-1 | 3.1.6 | The DEIS discusses quantity of potable water required by ship, but does not consider water ballasting requirments and related impacts to the local water system. Ballasting requirements are generally 20 percent of ship holding capacity - a large volume. |
| 3-26 | 3.1.7 | According to text, the eel-grass beds within Port Angeles harbor may reestablish "by the next growing season." The construction phase, however may overlap from one season to the other. Additionally, the next growing season implies that the biological community dependent upon the eel-grass beds would begin reestablishment within a year. This is erroneous. The biological community would experience an oscillatory phase of recovery over several years. If additional stresses are imposed (i.e. oil spillage), the community could be eradicated.<br>The light treatment given to this important marine resource raises serious concerns regarding the impact of construction and operation, not only on the flora and fauna endemic to the area, but its influence on the transitory visitors to the area, i.e. birds and some marine mamals. Oil retention by plants shows up for many years. What needs to be determined is the significance of this retention to the animal population. |
| 3-2 | 3.1.7 | There is an inadequate discussion of waterfowl in this section. It is not enough to simply state "waterfowl will be significantly impacted." More analysis of population, species, migratory habitats and actual amount of impacts should be included. |
| 3-32 | 3.1.7 | The statment on sea otters is misleading. Kerr 1974 states there is a threat to sea otters from oil pollution, and the possible contamination of whole populations by a major spill. The paragraph understates this potential. |
| 3-33<br>3-34 | 3.1.7 | Again, the discussion of migratory birds is inadequate. Eagles should also be mentioned here. In the event of an oil spill, eagles in the vicinity may be impacted when feeding on shore organisims. |
| 3-35 | 3.1.9 | It is stated that activity will displace bald eagles. No indication is given as to whether bald eagles may relocate, or to where that will occur. |
| 3-37 | 3.1.11 | The tank farm would be a visual intrusion upon the view to the north for many of the several viewpoints in Olympic National Park on the Hurricane and Deer Park Roads. |
| 3-39 | 3.1.2 | The statement that relocating log storage will cause economic, traffic and air quality impacts occurs without any discussion of those impacts. These impacts should be difinitively discussed. |
| 3-39 | 3.1.12 | The assumption of the 20-year life span for the project should be documented, through statement of history of usage of this type of facility. It is not highly unlikely that an oil port and pipeline of this magnitude will be be abandoned in 20 years, if it is within workable condition. Substances other than oil could also be transferred through the pipline, to continue its life. |
| 3-40 | 3.1.12-1 | The statement should explore in detail possible sites for relocation of displaced harbor uses, including the advantages and disadvantages of the possible sites as they relate to the uses to be displaced and the existing sites for those uses. |
| 3-34 - 3-41 | 3.1.12 | The statement addresses the impact of the port facility on existing log storage facilities, the pilot station, small boat marine and boat launch. With respect to impacts on log facilities the analysis does not develop the economic, traffic and air quality implications of using dry land log storage. Since this is a likely outcome, it should be analyzed completely.<br>Similarly the statement does not indicate the extent of impacts in terms of economics or safety with regard to relocating the pilot station, small boat marina and boat launch in order to accomodate the marine terminal. More than inconvenience, these actions would lprobably result in real losses in economic resources.<br>The statement does not consider the economic implications of change in land use at Green Point associated with the storage facility. REsidential developments may be affected with loss of income and property value.<br>Indirect effects of the oil port, storage facility and pipeline should be considered. The possibility of the establishment of oil refinery capabilities adjacent to the oil port should not be discounted. A 250,000 barrels per day refinery would require 1,000 - 1,500 acres of industrially zoned land.<br>The statement does not discuss the pattern of residential development likely to be brought about by the in-migration of construction workers and operational personnel. This is a serious shortcoming as it is difficult to asses public service requirements and revenue sources related to population in-migration. |
| 3-42 | 3.1.13 | As earlier discussed, comment to section 2.1.13 the statement does not discuss solid waste utility impacts. |
| 3-47 | 3.1.13 | The discussion on inland water transport contained in the statement does not develop the implications of increased harbor traffic during the operation phase of the oil port, or use of the harbor as a refuge by vessels. In the expected level of project related vessel traffic, 340 hulls per year, this well could be a significant impact, and should be discussed. |
| 3-43 | 3.1.13 | The limited discussion on construction phase traffic impacts makes it difficult to analyze whether the applicant proposed mitigating measures will be adequate. At a minimum, the following comments and questions should be addressed before the document can be finalized:<br>1) What will be the frequency and type of vehicular traffic on Ediz Hook as a result of Northern Tier construction?<br>2) What will be the traffic impact, (vehicles per hour, vehicle type, and hours of operation) on the downtown Port Angeles area?<br>3) Construction activities on the unloading facility will adversely affect the present roadway. Is Northern Tier prepared to repair or replace the Ediz Hook roadway?<br>4) What provisions have been made to regulate traffic during construction at the various construction sites?<br>5) What provisions have been made to provide parking, material stockpiling and equipment staging for the tanker facility?<br>6) What are the propsed haul routes for materials to be delivered by land?<br>7) The traffic figures shown in the application are unsupported by the City's present data. Could the supporting material be rpovided for City use in determining impacts?<br>8) Are there any provisions being made for mass transit movement of manpower both during construction and operation?<br>9) How does Northern Tier plan to hold down dust on the haul roads required by the project? |
| 3-43 | 3.1.13 | The statement touches on mitigating measures for traffic impacts which are based mainly on mitigation suggested by Nortern Tier. One area which is not addressed is on-site parking for workers vehicles, and construction vehicles and materials. To keep traffic conjestion on the Hook to a minimum, off-site parking is a necessity, and should be required and provided. |
| 3-43 | 3.1.13 | The statement refers to the area-wide TOPICS study by Harstad and Associates in 1973, but cites a 1.5% per annum expected growth rate, rather than the 5.3% per annum growth rate predicted by that study. |
| 3-43 | 3.1.13 | Under construction phase, indicated that "additional traffic generated by workers families and nonwork related trips should not significantly affect the impacts or extimated traffic volumes." This comment once again represents a superficial treatment given to several significant impacts throughout the statement. As earlier noted, the serious underestimation of the population during the construction phase effects this statement. The sinking of the Hood Canal Bridge, which will prevent a large number of commuters from the Seattle area or the Kitsap Peninsula for work should be anayzed. The statement also does not give any consideration to the crowded traffic conditions which exist in Port Angeles, particularly during the summer as a result of tourist traffic. |
| 3-43 | 3.1.13 | The presentation on high way impacts should be expanded to include an assessment of impact on service roads to the storage facility and pipeline construction sites. The statement should also take into account increased traffic to be generated by induced industrial development, e.g. refineries. |
| 3-42 | 3.1.13 | All the issues surrounding traffic circulation in the Port Angeles area, in the light of community goals and policies, as represented in the Comprehensive Plans of the City and the County, should be given consideration by this statement. The analysis should attempt to identify circulation problems which will be exaggerated by the project, and suggest means of ameliorating those impacts. |
| 3-46 | 3.1.13 | How will Northern Tier's tanker unloading facility, onshore tank farm, and pipeline system affect the availability of power to existing industrial, commercial, and residential customers of the City of Port Angeles Light Department and CC PUD during periods of "operating" and/or "planning" shortages of power. |
| 3-46 | 3.1.13 | The WPPSS nuclear projects have all had rescheduling of target dates for commercial operation. This affects the "planning" shortages of power by widening the period in which the regions forcasted power load would exceed the regional electrical resources. |
| 3-46 | 3.1.13 | The type (overhead, underground, or submarine) of transmission line which needs to be constructed to the tanker unloading facilities on Ediz Hook and the impact on the Hook need to be clarified. |
| 3-46 | 3.1.13 | The statement fails to mention in any regard the effect and impact of the Nortern Tier project on availability of fuel and gasoline in the Port Angeles area.<br>a) Will construction and operational fuel requirements of the pipeline facilities and vehicles affect the local availability of fuel for existing vehicles in Clallam County during periods of fuel curtailment or rationing?<br>b) Will bunker fuel demands made by the oil tankers affect the availability of bunker fuel for existing users?<br>c) Discussion of how bunker fuel is to be transported and stored for the refueling of tankers should be included. |
| 3-46 | 3.1.13 | The discussion on electrical power in the statement presents a draconian outlook regarding supply of electrical service to Northern Tier in the Port Angeles area. This is because Washington State law protects energy development facilities against interruption of electric power. Hence, the impacts of a major electric energy shortage would fall on local industry primarily, not on Northern Tier. The result of electric shortages might be relfected in massive lay-offs for extended periods in those industries. Hence, Northern Tier is not simply another user of electric power as implied by the discussion, but rather enjoys privileged status in terms of energy utilization. |
| 3-46 | 3.1.13 | The section on impact on utility networks apparently completely ignores impact on water and sewer systems. Impacts which are to be anticipated, and which should be discussed include the following:<br>a) Effects on domestic water and sanitary sewer for increased population during both construction and operation phases.<br>b) What method will be used to dispose of bilge waste and ballast water, and how will facilities for those methods be provided.<br>c) Will there be leakage to ground water from oily sediment which might be deposited on the Northern Tier berthing facility or the tank farm. Also, deleaching, if oily material is deposited in a sanitary landfill.<br>d) What method will be used for oily material which will result from cleanup of oil spills.<br>e) What method will be used to dispose of sanitary sewage and what quantity of sewage will be produced? What will be the impacts of this upon existing sanitary sewerage systems, and what further work will be necessary to accomplish the disposal of this type of sewage?<br>f) What provisions are being made to handle storm water drainage and treatment at the tanker facility?<br>g) Are there fresh water requirements for fire protection, what are they and how will they be provided? Have any provisions been made to supply the tanker facility with potable or other water in the event the City service is interrupted?<br>h) What amount of water will be needed for hydrostatic testing of the pipeline, where will this water come from, and where will it be discharged?<br>i) What will be the maximum use of potable water for ballasting, domestic and other similar uses, at the tanker facility.<br>All of these questions, as well as other that might occur as a result of consideration of impacts upon water and sewerage systems, should be analyzed and discussed in the statement. |
| 3-48 | 3.1.14 | What would be the effect on Olympic National Park beaches on the west side of the Olympic Peninsula, should a tanker collision and oil spill occur off Neah Bay?<br>The statement makes no mention of the close proximity of the Dungeness Spit to Port Angeles Harbor or Green Point. Dungeness Spit is a major recreational area, attracting over 80,000 visitors in 1978. A large spill would have a significant impact on this recreational use. |
| 3-48 | 3.1.14 | The discussion does not attempt to quantify the economic value of recreational sources lost (including tourist industry losses) due to construction and operation of the marine terminal and storage facility. Economic losses should be calculated in terms of employment, retirement in-migration, value of goods and services sold and public revenues. Recreation-oriented tourist industry is growing |

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at a rapid rate and is expected to continue to grow in the future. During the past few years the State of Washington has experienced higher than expected population growth rates due to heavy in-migration associated with an industrial boom period. Incomes have risen at a fast pace as well. Thus, recreational oriented tourism in areas like Port Angeles can be expected to grow dramatically. With that in mind, the economic loss associated with potential adverse impacts from the NTPS could be devastating to the community.

3-49 3.1.15 The Canadian Environmental Protection Service has published the results of a study of the impacts of an oil spill and tanker-related problems in various areas along the Britich Columbia coast on Indian fishing and fish processing industries. This report discusses in detail the locations of the various commercial Indian fishing fleets, the number of fishermen and vessels used and the gross revenues for ecah. The reports presents dollar values of losses to each Indian fishermen under various oil spill scenarios between the year 1978 and 2007. A similar study should be made for the American Indian commercial fishing fleets that would be impacted by an oil spill in the Strait of Juan de Fuca.

3-49 3.1.15 The loss of tourism dollars during construction and operation is discussed in generalities, when, in order to develop mitigating measures, specifics are necessary. It is further not mentioned that serious crowding conditions in housing, exist during the summer months.

3-49 3.1.15 While there are many generalities contained as to costs of providing additional public services, no statement is given as to the fiscal responsibilities or problems occasioned by this. No specific data are given at any point in the statement concerning dollars amounts of the impacts which require mitigation. A rigorous and thorough cost/revenue study of the projects impacts is needed in order to fully and completely analyze the impacts, and analyze the possible mitigation of those impacts.

3-49 to 3-55 3.1.15 According to the statement, construction phase population in Clallam County would rise to a maximum of 1,100 during the first four months of construction. Average population during the 18 month period of construction would be approximately 525. The procedure for generating indirect (service) employmnet assumes a three month lag for primary expenditures to result in generation of secondary employment. In addition, at the peak of construction activity, workers commuting from other counties would increase the daytime population in County by 300. Assuming a similar proportion of peak to average for construction-related in-migrants, average daytime commuter-worker population would be 143. The peak population increase including commuters would amount to approximately 3% of County population (based on 1977 population of 41,000). Accordingly average construction period population increase would amount to only about 1.5 percent of County population on the basis of this projection.

The methodology for determining construction phase population impacts as presented in the statement is reconstructed as follows:

a) Initial phase construction workforce (709,000 barrels per day) data is distributied over 18 month period of construction.
b) Construction workforce for Clallam County includes manpower requirements for terminal submarine pipeline, storage facility, and part of Section I pipeline.
c) Local component of workforce estimated on basis of sliding scale relating-percentage of local population workforce to total population. The actual local workforce proportion of in-state construction phase workers is not given.
d) Out-of-state component of workforce is broken out based upon average of 15% for all deliver facilities and 41% for pipeline.
e) Induce ans indirect employment was estimated on the basis the Bureau of Economic Analysis "Guideline 5 Regional Gross Output Multifpliers. The procedure for generating indirect (serv8ce) employment assumes a three month lag for primary expenditures to result in generation of secondary employment. The multiplier values for Clallam County are not indicated.
f) Indirect employment was distributed between local and non-local components in the same way as the in-state share of the construction workforce.
g) Construction workforce and indirect workforce was combined to calculated total employment (non-local).
h) Transient population (project-related in-migrants) was estimated on the basis of survey data (Old West Commission) which indicated that 48.9 percent of non-local construction workers are accompanied by families of 3.61 persons (average size). Thus, transient population estimated at 2,279 times the number of non-local workers.

The average (over 18 month construction period) ratio of total construction workforce to total transient (in-migrating) construction related population is 1.82 (assuming a construction period average of 289 workers and average population of 525). The average ratio of the non-local construction workforce to total transient population is 3.1 (assuming a monthly average of 170 non-local workers and average population of 525.

3-50 3.1.15 It is stated that "Fish production reduced by an oil spill could reduce the income of commercial and Indian fishermen. Additional work will be done to assess these losses when estimates of biological effects are completed." The final report should discuss current income to both commercial and Indian fishermen, and it should estimate the dollars loses that would result from a fish kill due to an oil spill. The final report should also document these numbers and give sufficient details as to how they were calulated.

3-50 3.1.15 The statement claims that 110 more (secondary) jobs would be generated by construction worker expenditures and local construction procurement. Other portions of the statement establish that very little construction materials will be manufactured or purchased locally. Thus this "multiplier effect" is probably overstated. Also, the statment should document the estimate of 160 local workers out of 750 peak jobs. How was this number developed? Further, to the extent that local hiring involves currently employed workers rather than unemployed persons or new entrants into the labor force, the project jobs and income are not necessarily a net benefit to the community.

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3-50 3.1.15 Employment and population effects of the operation phase could be underestimated due to the following:

1) Relocation of ship crews and families to Clallam County.
2) Buildup of ship services and maintenance facilities.

Document states that, ". . .tanker crews (and families) would probably not reside in Clallam County even if their ships were based there, since their travel to and from home is at shipowners expense." This wrongly implies that payment for travel expenses is the criteria for crews locating in one area or another.

3-50 3.1.15 The document sites a personal communication with someone in the Washington Employment Security Department as reference for the claim that it is unlikely that many job seekers would stay without employment. That statement may not be correct.

3-50 3.1.15 Statement submits that damages from an oil spill would have minor effect on tourism, which perfectly contradicts a statement on page 3-47, paragraph 3.1.14 Recreation Resources, Operation Phase, to the effect that an oil spill or submarine pipeline rupture would substantially disrupt tourist visitations. The report speculates that oil tanker collision, spill's, etc. would "Affect a significant number of recreationists." How then can the report make the assertion - three pages later - that damages from an oil spill would have minor impact on tourism?

3-50 3.1.15 The document does not quantify the loss of tourist business that would result from an oil spill. All the report says is that Santa Barbara motel business was down about ten percent during the summer of 1969 following the massive oil spill there. The document notes that increased motel business in the rest of the county caused the county total to increase. The statement should either make a rigorous analysis of the tourist business in Clallam County and show why tourist business losses would be small, or the statement should explain why Santa Barbara and its tourists are so similar to Clallam County and its tourists that virtually the same result could be expected here. Additionally, data should be presented to allow one to put the "10 percent tourist drop" figure in perspective. How do we know that without the oil spill the tourist business might not have been up say 20%, thus making the total less 30%?

3-50 3.1.15 The statement makes the comment ". . .additional petroleum-based industry is unlikely." This statement is broad and far ranging, and requires more definition and detail basis.

3-51 3.1.15 The statement's treatment of impacts upon police is superficial. The statement relied upon is from the acting chief of police, compares small projects in the past with the construction of the marine terminal facility, when common sense would indicate that there is no basis for comparison. The grasping of that particular statement as a basis for denying all impacts is to simply ignore the existance of the problem. Also, once again, the population figures indicated are considered by the City to be extremely understated, and that understatement carries through to this area of the impact statement as well. Listed below are a few of the impacts which the statement should consider:

A During Construction.

1. Traffic increase in volume to and from the Ediz Hook site will be significant. All materials and construction workers will be in direct competition and conflict with existing eindustry west of the downtown area to the construction site unless moved via water or air. Bottlenecks due to physical layout of the streets (such as the area through Crown Zellerbach mill) as well as those created by shift changes at Crown Z or M & R Timber Company mill are seen as major accident causing factors that will require the constant attention of law enforcement officers.

2. The influx of construction workers will increase the volume of activity in areas of housing, in restaurants and recreation facilities, and in drinking establishments. All of these factors will mean an increase in the volume of incidents such as fights, vandalism, assault, disorderly conduct, family beefs, both major and minor crime.

3. Parking will be effected by the influx of construction workers particularly where it conflicts with the fisherment parking on Ediz Hook. Parking has been a problem for several years on Ediz Hook due only to the volume of fishermen without the confusion of a large construction project.

4. The stockpiling of construction material and equipment will be a major concern during construction due to its being a potential target for sabotoage, vandalism, and theft. A major construction company has been active on Ediz Hook in recent years on a project very favorable to the vast majority of the populace. Vandalism to their equipment was frequent and costly until fairly expensive and extensive steps were taken. Oil port construction will be many times more significant due to the project being as unpopular as it is.

B Operation Phase:

1. The people who will man and operate the oil port physical plant, related tug and service vessel, security people, maintenance people and other who will be permanently located in Port Angeles and Clallam County will increase our population. A fair percentage of the tanker crews who will be traveling between Valdez, Alaska and Port Angeles as a regular routine run will surely select Port Angeles as their home port. Increase in population due to these people will generate a considerable number of new housing units, new businesses, new utilities and services, all of which will be come a concern of law enforcement in the protection of life, limb, and property.

2. The City's ratio of law enforcement officers to population at present is considerable below the state and national averages. Support service employee numbers are about average considering the broad areas of responsibility in addition to the regular and usual operations of a police service of our size. The people of our community deserve police protection equal to or exceeding present level service and will demand equal the average level in our state.

3. In the event of any type of disaster related to an oil port be it an extensive oil spill, fire, or explosion, there would be added responsibilities of the protection of life and property for law enforcement. Depending on the type of emergency created, there would always be traffic control problems for emergency vehicles and crews to a greater or lesser degree.

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4. An impact not addressed is the present physical facility which is small and cramped to capacity. Added personnel will require remodeling and expanding the present police building at a considerable cost.

3-53, 3,54 3.1.15 The statement does not address the explosion or major fire possibilities adequately. No plan or method of warning is included. A major problem would be the evacuation of areas from the lower section of the city and the areas along the bluff. Any explosion in the harbor will produce a shock wave which would have no resistance over water with the full effect along the shoreline into the central area. The Coast Guard Report, 16732/71895 notes that minor damage extends 3 to 6 miles from the explosion with the shock wave traveling overland. The 200 ft. height of the bluff would have very little deterioration power of the wave and might reinforce it due to energy uplift from the surface front. A shock wave from Ediz Hook would extend into the atmosphere as far as it would extend in all directions from the center of the explosion. Therefore a shock wave reaching the shoreline could be high enough to damage the structures on the bluff including the hospital and possible cause the chlorine at ITT-Rayonier to rupture.

3-55 3.1.15 The last sentence in the second paragraph states: "The annual salmon derby would be significantly effected by the presence of large tankers." Once again, an impact is identified, but the effect of this impact on the community is not analyzed.

3-104 3.2.12 Under land use and zoning the relationship of the project to the shoreline management plans of the County are not spelled out, the cited CFR requires that the relationship be spelled out.

3-105 3.2.12 Pages 3-105 and 3-106 do not adequately detail the land use impacts of the pipeline. The pipeline corridor attracts undesireable recreation activity (promiscuous shooting), vandalism, trespass, sabotage, poisonous weeds in Western Washington. Maintenance roads generate subdivision activity. The pipeline splits wooded and agricultural ownerships creating land management problems. Some ownerships are intersected in a fashion which creates small slivers of land which can not be managed for any use. Uncontroled recreation uses create erosion problems and damage to corridor vegetation. The erosion problem could become severe on slopes exposing the pipeline and possibly damaging the pipeline. The statement should specify how much timber land in each county of Western Washington will be lost due to the construction of the project.

MITIGATING MEASURES

| Page | Section | Comment |
|---|---|---|
| 4-2 | 4.2 | The statement notes that no significant mitigating measures are identified. In the proposal of Standard Oil of Ohio to construct a tanker facility at Long Beach, California, a significant number of mitigating measures for air quality were identified, including a detailed analysis of a trade-off, in which the applicant would upgrade and improve existing air quality sources, in exchange for being allowed to operate its facility, thereby degrading the air quality. This mitigation was on a more then one-for-one basis. A similar analysis of existing air pollution sources, the possibility of the applicants cleanup of those sources, and the resultant effects upon air quality should be considered. |
| 4-2 | 4.2 | As earlier noted, tankers off loading crude oil at Port Angeles should be required to burn 0.5% or less sulfur content bunker fuel, and measures to enforce that limitation should be included in any approval granted to Northern Tier. |
| 4- | 4.2 | Only tankers having segregated ballasts should be permitted to use the proposed berthing facilities. This will reduce hydrocarbon and oxygen impacts resulting from ballasting of older nonsegregated or partially segregated tankers. |
| 4-2 | 4.2 | Only tankers having inert gas or equivalent systems should be permitted to use the proposed berthing facilities. |
| 4-2 | 4.2 | Trained inspectors, paid for by the applicant,should be provided, perform complete monitoring of all air quality impacts, from the time a ship enters the harbor, until it departs. The inspector should have the authority to monitor air and water pollution, and safety, and should have the authority to not allow or cease the discharge of oil from the ship until such time as all air and water pollution control features are in full and effective operation. |
| 4-2 | 4.2 | Measures should be incorporated in any approval to ensure that purging a vessel will take place only in emergency situations. Monitoring should be provided, to detect any unpermitted purging which might occur. |
| 4-2 | 4.3 | The applicant should be required to equip all pumps, vehicles and construction equipment with appropriate noise suppression devices. |
| 4-3 | 4.7 | Wind and weather conditions under which tanker unloading would not be permitted, due to the excessive risk of oil spills should be established, and standards for enforcement established. |
| 4-3 | 4.7 | The statement says, "effectiveness of the recovery vessel can not be determined...". How can this document be used as a decision making device, when critical areas are ignored, because the applicant has not, as of the date of the statement, fully prepared the proposal. The worst case analysis must thus be considered, because of the failure of the applicant to make it possible to determine the effectiveness to propose mitigating measures. |
| 4-3 | 4.7 | The applicant should be required to prepare an oil spill contingency plan for the marine terminal, prior to permanent issuance. This plan will be designed to reduce reaction time by specifying the sequence in which necessary action must occur, what must be done, as well as defining prior to the occurrence of a spill the best technique or techniques for cleaning up a type given spill, depending upon location and size. |

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| 4-3 | 4.7 | The applicant should be required to establish some form of contingency fund, based upon barrels per day, vessels, or some other easily ascertainable and reasonable basis, in which funds will be deposited to provide for expenses involved with cleanup of private and public facility damage due to an oil spill, of whatever size. This "contingency fund" should be created and approved prior to the beginning of construction of the facility. |
| 4-3 | 4.7 | Standards for tankers which will be allowed to use the port should be established, including navigational systems with which each vessel must be equipped, propulsion systems with which each vessel must be equipped, backup systems which must be on each vessel, and other such requirements. Further, each vessel should be required to be financially responsible for any losses which might be occasioned as a result of an oil spill caused or occasioned by the particular vessel. |
| 4-3 | 4.7 | All available operational standards which can be used to lessen the risk of minor spills during unloading or presence of the vessels in port should be identified, and the applicant should be required to enforce those provisions against all vessels calling at the port. |
| 4-4 | 4.8 | Revegetation measures referred to should be referenced by page, to allow easier access for reference purposes. The discussion in Chapters 1 and 3 was not detailed enough, as specific species were not listed, nor were management plans discussed. |
| 4-5 | 4.10 | It is the exact procedures for resource identification and preservation should be identified and explained. |
| 4-6 | 4.12 | The pipeline should include equipment to detect sub-threshold leaks almost immediately, with particular emphasis upon sub-threshold leaks at environmentally sensitive areas such as rivers and streams. |
| 4-7 | 4.13 | The applicant should guarantee that damage to streets and highways caused by reason of the increased traffic and the increased size of the traffic will be at the applicant's expense. |
| 4-8 | 4.14 | The applicant should be required to relocate the recreational facilities located on Ediz Hook which will be displaced by the construction of the berthing facility. |
| 4-8 | 4.15 | Rather than merely identify sources of assistance to energy impact communities, Northern Tier should be required to bear the financial costs of impacts which occur to impacted communities. This would include payment by Northern Tier for increases required in police protection, fire protection, sewer and water facilities, and other similar services provided by the City of Port Angeles and Clallam County. This should include planning for the impacts, as well as the implementation of the mitigating measures. This should occur for both construction and operation phase of the project. This should include the cost incurred by the city and county in preparation of responses to the application, the impact statement, and other associated costs. |

UNAVOIDABLE ADVERSE IMPACTS

| Page | Section | Comment |
|---|---|---|
| 5-2 | 5.12 | The section on visibility should include an analysis of the visibility problems that will be encountered if the tank farm is separate from the marine terminal. |
| 5-5 | 5.17 | More attention should be given to long-term exposure to minor spills in everyday activity, and resultant contamination of marine organisms and resources. More study in research and investigation appears warranted here. |
| 5-5 | 5.17 | Port Angeles harbor currently has a Class A water rating. Northern Tier proposal, including as it does on many minor spills, will undoubtedly degrade this water quality. Will the Class A rating be lost, and if so, what rating will result. |
| 5-5 | 5.17 | This paragraph states that "strategic booming" near Green Point could contain a spill, and implies that conditions in the harbor can be equated with conditions off Green Point. Green Point is subject to intense oceanographic conditions which the protected harbor is not, and this misrepresentation should be corrected. Further, the question arises as to whether booming in the open sea would affect the oil containment method. |
| 5-6 | 5.17 | The statement says, "a chance encounter with phytoplankton zolplankton...". This statement is ambiguous, as no probability is offered. |
| 5-6 | 5.17 | The statement that seals would avoid contaminated areas is questionable, and is in conflict with the statement on Page 5-17 where it is stated that little is known about the effects of oil on seals and other marine mammals. |
| 5-8 | 5.1.12 | The exact location of the project as described is too vague to determine actual displacement of the amount of log storage which will result. Further, the impacts of the displacement are not adequately addressed, particularly as it deals with additional log traffic on city streets, the effect of land log storage on air quality noice pollution, and the effect of dry land log storage on the economics of the timber industry. |
| 5-8 | 5.1.12 | The statement shoeld identify and examine alternative locations for facilities displaced by the terminal, to include the pilot station and the Thunderbird Boathouse. |
| 5-8 | 5.1.12 | The description of an unavoidable adverse impact of "nuisances" to other harbor users is insufficiently specific. None of these impacts have been addressed at any point in the statement, in a qualifiable or otherwise understandable manner. |

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| 5-9 | 5.1.12-2 | The statement that a large oil spill in the harbor is to be expected once every 255 years is inconsistent with the Northern Tier application of the Washington State Energy Facility Site Evaluation Council, which, at Page 8-38 indicates a much higher likelihood of such a spill. Further, the indications in the explosion analysis that impacts "might be" incurred is insufficiently specific. Probabilities for damage is to be established and discussed. |
| 5-9 | 5.1.13 | If vertical omni-range station needs to be relocated, there would be an adverse impact on air navigation in the Port Angeles area. No alternate site for the VOR has been located and identified, nor the impact of relocation been analyzed. |
| 5-9 | 5.1.13 | Where will tanker fueling take place in the harbor. No indication is given of what impact the increased tanker traffic and fueling will have on restricting present traffic in, out, and within the harbor. |
| 5-11 | 5.1.15 | The unavoidable adverse impact on social and economic services from the project are based upon a previously discussed erroneous population estimate, and previously discussed erroneous lack of assumption of mitigating measures at the cost of the applicant. |

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

| Page | Section | Comment |
|---|---|---|
| 6-1 | 6 | This introductory paragraph speaks of Port Angeles as if it were an area of environmental significance, but uninhabited by human life. Short and long-term trade-offs which occur involving the social and economic issues of the area must be discussed in this section. Future expansion of the community and its present economic livelihood is probably threatened because of the impact on the area by the Northern Tier proposal. as has been extensively discussed prior to this paragraph. |
| 6-1 | 6.1 | Existing industries within the harbor have entitlement to continue their operations and possibly expand. No indication is given as to where facilities which will be displaced are to be relocated, and of the future expectations for those facilities once relocated. |
| 6-2 | 6.1 | In the last paragraph on tanker unloading, it is stated "a major spill is not likely to occur during the lifetime of the project". This sentence is open to serious questioning, and must be substantiated. Even Northern Tier, on Page 8-38 of its application to the State, indicates that with 3 berths, there is a 40% chance of a total vessel loss occurring during the life of the project. This does not appear to justify the use of "not likely" in a description of trade-offs which might be required as a result of the project. |
| 6-3 | 6.3 | This statement does not explain the size of the harbor easement NTPC intends to obtain for the unloaded facility. The area required is much larger than is really needed for 3 berths. Northern Tier should explain the purpose of the larger easement,and the cumulative impact involved. See Page 7-4, Section 7.91 |
| 6-4 | 6.3.2-1 | This table does not indicate whether OIW considered: a) Canadian shipping,b) Port Angeles-Victoria traffic, and c) an expoenential frequency with increased traffic rather than arithmetic frequency. |
| 6-6 | 6.3.2-4 | How is the word "casually" defined? |

ALTERNATIVES TO THE PROPOSED ACTION

| Page | Section | Comment |
|---|---|---|
| 8-1 | 8.1 | Unit trains should be addressed in this section. Merely because they will not handle the 933,000 barrel per day through put of the project is not a sufficient reason to discount a possible alternative which could, to a significant degree, constitute an alternative to the proposal. |
| 8-1 | 8.1 | The oil and gas journal of November 13, 1978, Page 122, suggeststhat the four cornerspipeline through put could be increased to 150,000 barrels per day. |
| 8-2 | 8.1 | Alternative energy sources should be addressed as in the ENT statement, as the development and implementation of an alternative energy souce may make the proposal unnecessary. This informationis, therefore, necessary to evaluate the justification established for the project. |
| 8-2 | 8.1 | The statement, indicating that exchanges of oil with Japan would not relieve the West Coast surplus, appears to be an erroneous statement. Assuming that the exchange was in the amount of the West Coast surplus. the situation would, in fact, be remedied. |
| 8-2 | 8.1 | Does not the Northern Tier proposal also require dependence on foreign crude, as a large portion of the oil which is to be moved through the line must consist of that type of oil, rather than an Alaskan oil. |
| 8-2 | 8.1 | Would not increased domestic production and reallocation of existing crude oil supplies provide an alternative to construction of the Northern Tier proposal, and should this not therefore be considered. |
| 8-3 | 8.2 | The statement that 1,100 barrels of oil could be spilled per year at Cherry Point, 939 barrels at Burrows Way, and only 887 at Port Angeles should be substantiated and explained. |
| 8-3 | 8.2 | The last paragraph on this page states that:<br>"Operation of submarine pipeline would increase the risk of marine oil spill."<br>This statement should be expanded, to describe the nature of the spill from a submarine pipeline, and further impacts. |

CONT.

| Page | Section | Comment |
|---|---|---|
| 8-5 | 8.2 | The West Coast crude oil surplus, forming the basis for this discussion, is undefined. Does this involve Alaskan crude oil which may or may not be able to be used by refineries in the Northern Tier states, or does it also address West Coast crude oil? |
| 8-7 | 8.3.1 | The no action alternative does not discuss the existing source of supply to the Washington refineries through the Trans Mountain pipeline. |
| 8-7 | 8.3.1 | This section presumes that other alternatives would not be put into effect, and that, therefore, the Northern Tier proposal is necessary to deal with the excess supply of West Coast crude oil. The statement should assume that other alternatives are put into effect, and analyze the no action alternative on the Northern Tier project from that. |
| 8-10 & 8-19 | 8.4.1 | What data base was used to assume that meteorological conditions at Cherry Point and Burrows Bay are "very similar" to Port Angeles and down wind area. The rainfall in the down wind area from Port Angeles, particularly Sequim and the Dungeness area, is different from any area close to either Cherry Point or Burrows Bay. |
| 8-45 | 8.4.1.6-3 | Pipeline spill frequency is not consistent, because different pipeline miles are used. To give a clear picture, all sites should be calculated with a common denominator. |
| 8-45 | 8.4.1.6-5 | Isn't there an inconsistency in the statement that a 117 mile pipeline from Cherry Point to North Bend would spill only 1100 barrels per year, while a longer line, from Low Point, would spill 876 barrels per year. |
| 8-49 | 8.4.2 | The term "public preferences" is meaningless, as the preference is dependent on numbers, what groups, and location of the group analyzed. |
| 8-49 | 8.4.2.1 | The Cross Sound pipeline will obviously involve more than 5 days of construction in the Port Williams staging area. |
| 8-56 | 8.4.2.1 | The statement comments that "the alternative route would probably follow existing corridors whenever practical". This language must indicate that the route is not sufficiently defined for an adequate environmental assessment to be performed. |
| 8-103 | 8.4.3.2 | The analysis of the Kitimat air quality indicates that "major new hydrocarbon sources" will be introduced to the Kitimat area, while no such similar statement is made for the air quality analysis for the Port Angeles port. |
| 8-104 | 8.4.3.2 | It should be noticed that the status of the Kitimat proposal is not static, as Kitimat has filed for expedited review. |
| 8-104 | 8.4.3.3 | Trans Mountain has also filed for expedited review. |
| 8-104 | 8.4.3.3 | It is stated that tank design features will minimize hydrocarbon release, without specifying those features. Were these features included in the environmental assessment of the Port Angeles port. |
| 8-111 | 8.4.3.7 | As of March, 1979, how many tankers of over 200,000 deadweight tons are available for the Jones Act Fleet? How many ships of that size would be needed to move the West Coast surplus around Cape Horn on a monthly basis. |
| 8-111 | 8.4.3.7 | What is the current status of the potential looping of cap line,and its relation to LOOP? Further, was the expansion of explorer pipeline in August, 1978, completed, and what effect does this have upon capacity versus through put. |

## A F F I D A V I T

STATE OF WASHINGTON)
) ss
COUNTY OF CLALLAM )

The undersigned being first duly sworn, on oath deposes and says:

That on April 2, 1979, she deposited the attached:

Comments by City of Port Angeles on BLM EIS on the Northern Tier Pipeline Company Proposal

in the United States mail, in an envelope properly stamped and addressed to the Bureau of Land Managment, Oregon State Office, 729 NE Oregon Street, Portland, Oregon 97208.

SUBSCRIBED and SWORN to before me this 2nd day of April, 1979.

Louise Frost
NOTARY PUBLIC in and for the
State of Washington,
residing at Port Angeles.

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March 30, 1979

Bureau of Land Management
Northern Tier EIS Team
Portland, Oregon

Attn: Mr. Al Leonard

Dear Mr. Leonard:

Enclosed is a copy of the Washington Environmental Council resolution on Oil Legislation and Oil Pollution.

As a Board member of WEC I would like to have this resolution made part of the record of public comments on the Northern Tier Pipeline Environmental Impact Statement of January 5, 1979 .

The draft EIS on NTPC done by your office makes frequent comments on public positions regarding alternative routing, terminal and other aspects of the proposal thus it seems reasonable to submit the WEC resolution as a gauge of the public sentiment on this important issue.

Thank you for this opportunity to participate in the comment process.

Sincerely,

Eloise Kailin
Eloise W. Kailin, M.D.
Rt. 6 Box 171
Sequim, Washington 98382

encl: WEC resolution on Oil Legislation and Oil Pollution

WASHINGTON ENVIRONMENTAL COUNCIL
107 SOUTH MAIN, SEATTLE, WA. 98104 / 623-1483

POSITION ON OIL LEGISLATION AND OIL POLLUTION

Re-affirmed Jan. 13, 1979

Supporting a clean marine environment and maximum protection against oil pollution, WE FAVOR:

1. No transshipment of fossil fuel and/or petroleum products through Washington State unless and until it is established after full compliance with the Shorelines Management Act, SEPA, NEPA and all other laws and regulations for environmental protection, that each of the following conditions are met:
   a) All the alternatives to such transshipment and their environmental consequences have been considered;
   b)Transshipment through Washington State is
      (i) the least environmentally damaging alternative, and
      (ii) declared by the President and the Congress to be essential to the national interest and by the Legislature and/or the people of the state of Washington to be in the best interest of the State of Washington;
   c)The point(s) of offloading, methods and routes of oil transport within Washington State are evaluated and the least environmentally damaging alternatives identified and selected.
2. Strict land use controls to limit development as a result of such a facility being built.
3. Advanced pollution control equipment on standby at oil ports.
4. Mandatory use of double bottom tankers.
5. Mandatory use of tug support for tankers
6. No underwater segments of oil pipelines.
7. Sizing any oil terminal to handle all oil coming to Washington and B. C. refineries and being shipped from them.

[illegible]

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1231 Ohio Street
W. St. Paul, MN 55118

March 30, 1979

Bureau of Land Management
U. S. Department of the Interior
Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Gentlemen:

In your series of public hearings held during the month of March for the purpose of reviewing the draft environmental impact statement covering transportation of crude oil via Northern Tier Pipeline, many parties of interest were afforded opportunity to present their respective views. I was unable to attend any of those scheduled hearings, however, I want to be listed among those who favor the Northern Tier proposal.

My views, simply stated are this. The Upper Midwest and the United States are facing a disastrous energy crisis which has grown in severity since the oil embargo forced upon us by the OPEC nations in 1973. The intervening six years has been a period of idleness here in this Country, when one attempts to measure any progress made toward some degree of energy independence. The fault for this lack of accomplishment lies with all of us. The resulting high cost of energy which is upon us today must also be borne equally.

There comes a time when the basic needs of the citizens of this Country become paramount. Much as we might prefer to move cautiously, observing such things as we individuals might consider desirable, we are nevertheless forced to cast aside those individual desires in favor of attaining what is essential for our Country.

Providing a means of transporting Alaska crude oil to the interior is an absolute need for the Upper Midwest and for the United States. We have run out of choices. We must pave the way for immediate commencement of construction of the Northern Tier Pipeline.

Please accept this letter as one very concerned citizen's plea for favorable handling of the proposal.

Respectfully,

David R. [illegible]

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DEDMAN'S PHOTO SHOP
BOX 417
SKAGWAY, ALASKA 99840

March 28, 1979

Bureau of Land Management
Carter's Energy Commission

Dear Sirs:

I would like to add to my spoken testimony at the Bureau of Land Management hearing last week in Skagway concerning the Foothills pipeline proposal. My name is Elisabeth Albecker and my family moved here during the gold rush 80 years ago. I am part owner of Dedman's Photo Shop which has been in business here in Skagway for over 50 years and I own several lots and my own home. I am not in favor of the pipeline but I sincerely doubt that anyone cares what I think. In case I have any arguments or suggestions which have not already been covered I am listing them as follows:

① Skagway (population app. 900) is suffering a mild depression due to the finishing of the Klondike Highway and a decline in business for the White Pass & Yukon railroad. A construction camp, self-contained we've been told, will definitely add business to the town. The camp would be located less than a mile away from the local business district. It seems reasonable to suppose that a large proportion of the workers would want to bring their families up. This pipeline job is expected to last two years and employ a minimum of 50 people and a maximum of 500 during the peak period. Families would not be provided for in the camp so they would have a definite impact on the town. We have been told that the city would provide water and sewage to the camp. We have inadequate sewage facilities right now and our sewer plant is a brand new one just finished last summer. The water supply is at present inadequate in the winter. I suggest that someone make it very clear before anything is started, exactly who is going to provide what services and how they propose to finance them. If extra families show up we will be forced to build an addition to our school also. It is barely adequate for the present student body. Who will pay for upgrading the school and how will we maintain it when the construction workers have left and we no longer need a larger facility?

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② Several local businessmen claimed that the local economy is faltering badly. It is only faltering in comparison to the short-lived boom we experienced with the road construction crews that were here building the Klondike Highway. Speculation drove land prices and taxes quite high and they are remaining high as everyone gears up to get rich off the pipeline.

The White Pass & Yukon railroad lost several valuable contracts this year and seem disinclined to pursue the tourist trade. They are the major support of Skagway, followed by tourism and then the National Park Service. The Foothills pipeline people wish to lease a 40 foot right-of-way from White Pass following their track to lay a buried 54 inch pipeline. If White Pass leases their right-of-way how seriously will traffic be held up while the construction is proceeding? Who will gain the most benefit, the Canadian-based business? Will the railroad be expected to continue in business after the pipeline is built or will they be getting so much from the leasing that it will be unnecessary to go back into the transportation business? Is it possible that the White Pass is going to claim that since they don't have enough profitable business right now they need to lease their railroad right-of-way to the pipeline people to keep from going broke?

③ Sections of this railroad were built by hanging men over the sides of the cliff to blast out a narrow-gauge right-of-way. I'm interested in seeing how a 54 inch diamete pipeline can be buried in that terrain. How much of the mountain will have to be moved? Most prevalent on the American side of the border is rotten granite that avalanches every year. This is also along an earthquake fault line though we've had no serious ones to date. The avalanches cannot be prevented. Is it possible that these rock slides could break the pipeline? What are the minimum and maximum amounts of oil that would spill if such a break occurred? How would one clean up a spill in an avalanche area? What sort of equipment could be used and what would not be feasible? When the oil seeped down through the rocks would it necessarily contaminate the Skagway ground water? All the pipelines so far built in Alaska have had minor spills. It seems foreseeable that this one would too.

④ Much has been said about what an oil spill could do to the Lynn Canal in destroying valuable, viable fisheries. People in favor of the development men point, rightly so, to many areas where pipelines and offshore developments have enhanced wildlife and fisheries instead of harming them. The thing to consider is...how many ships have gone aground, hit rocks, or gotten damaged in other ways in the last 20 or 30 years in the Lynn Canal area? Were most of them large ships or fishing vessels? What was the major cause of mishaps? Did these ships have trained pilots bringing them through the channels? How many tankers have been wrecked world-wide in the last 10 or 20 years? Is the number increasing or decreasing? What is the major cause of tanker wrecks? What sort of areas have the largest proportions of wrecks?

⑤ How rapidly is clean-up technology progressing? What shape are the areas in now that contended with major spills 2, 5, 10, and 20 years ago? Are there other areas in the world that have our extreme weather and coastal conditions and have successfully cleaned up spills of any size? What was the cost? Who would be responsible financially for maintaining cleanup crews in the area in the line of being prepared for such an accident? Who would pay for the cleanup itself if a spill happened? Suppose the spill was caused by weather conditions and not human error, who then would be responsible? What size clean-up crews should be maintained and where should they be based? If they aren't deemed necessary why not, and supposed something happened then, would the fishermen be allowed to sue? Who would they sue? Have all these suppositions been looked into?

⑥ Since tourism is our main industry in conjunction with the railroad, what impact would tankers arriving every other day have on our local tourist trade? We have cruise ships plying the Inside Passage during the summer months, is there plenty of room for all this shipping? Is it possible that cruise and ferry ships would be asked to make fewer trips to Skagway because they would be in the way of the proposed tankers? Wouldn't this adversely affect the businesses that depend on tourism for their livelihood?

If Skagway needs more economic development why couldn't we set up a government research center on alternate power resources? We certainly have the wind and the tidal currents available. Most summers don't have a lot of sun but there are many hazy days that solar power would still be usable. The government is already involved with the town because we are now a National Park. Couldn't ecologically beneficial studies be carried out here too. Development and employment would proceed at a more manageable rate and we would not have to worry about a disastrous backlash when things slowed down as we definitely will have to face if the pipeline comes in.

I repeat, I am not in favor of the pipeline at all. Spend the money developing plain old alcohol as a fuel for both burning and for cars. It is superior to gasoline and can be manufactured extremely cheaply from present agricultural wastes. Check into the use of methane. Hydrogen is a coming fuel. The United States has no business being dependent on the Middle East for fuel. If you don't have any Mother Earth people on your committee you should ask yourselves how come? You're behind the times dear gentlemen.

Sincerely,

Elizabeth (Betsy) Albecker
Box 65
Skagway, Alaska
99840

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TO: BUREAU OF LAND MANAGEMENT
RE: DRAFT EIS, NORTHERN TIER PIPELINE CO. PROPOSAL
FROM: PROTECT THE PENINSULA''S FUTURE, ELOISE KAILIN, SEC''Y.

① In addition to verbal comments made at your hearing in Port Angeles on March 15th we wish to submit the following.

Our concern with the inadequacy of the geologic section of the DEIS is amplified by the recent decision of Northern Tier Co. to construct a seventeen mile underwater pipeline across the Strait of Juan de Fuca to Point Partridge on Whidbey Island. In " Submarine Pipeline Crossings of Admiralty Inlet, Puget Sound, a study of technical feasibility", submitted in Dec. 1975 from the Oceanographic Commission of Washington to the 44th Legislature of the State of Washington, page A-34 we read: " A feature on Seismic Profile CC-1 contains a high angle discontinuity in the near-bottom sediments and could be suggestive of faulting. It is about 9000 feet from Admiralty Head as shown on Plate A8." This profile was taken on a line from Point Wilson to Ebeys Landing on Whidby Island. In this same document see also page A-22. Here a thrust fault is shown across the southern tip of Vancouver Island and extending entirely across the Straits of Juan de Fuca to the mouth of Discovery Bay...right across the proposed pipeline route.

Your map on seismicity, map addendum, page 5 omits numerous epicenters shown on pages A-19 and A-20 of the Submarine Pipeline Crossings...etc. document referred to above. These faults are described as "The more important known or suspected faults within the Puget Sound region" ( ref. p. A-13) and should be reflected in your final EIS. Even with this information it is likely that the true picture of fault structure in this region cannot be known, since the region is covered by glacial alluvium and unconsolidated Quaternary sediments in most places and densely forrested in other areas, thus concealing fault lines. It has been only since 1974 that the active fault on Dow Mt. has been identified with evidence that the last major movement at this site, close to the originally-planned pipeline in Mason County at the southern portion of Hood Canal, occurred about 1200 years ago. Ref. page A-12 of above and Washington Geologic Newsletter vol. 2, #4 page 9-10.

Your references should include " A Geological and Geophysical Study of the Central Puget Sound Lowland" by William Patrick Rogers, a PhD. dissertaion from Univ. of Washington, 1970, Dept. of Geological Science. This work ( see its foreword) " uses geologic constraints to show that the major near-surface structure units in this area have the form of blocks, bounded by faults or by steep monoclines...it must undoubtedly be taken into account in the contemporary discussion as to the advisability of permitting petroleum development to take place in the Puget Lowlands". In Plate VIII epicenters are shown with two of them near Protection Island, near where the pipeline might be expected to pass. He also discusses the Kingston-Bothell Fault and the South Whidby-Possession Sound-Everett Fault on pages 48 and 49. These too must be taken into account in evaluating an underwater pipeline.

Since the pipeline is now thought to go just north of Sequim Bay at Port Williams it should be noted that in addition to a major hinge fault east of the Dungeness River along the west side of Mt. Zion there is " a second possible major fault along the north limb of the Clallam syncline in the vicinity of Washington Harbor. Here the Cowlitz lavas appear to be truncated and long scarp-like exposures are seen trending to the east toward Discovery Bay." Reference: Lawrence Bradley McMichael, Geology of Northeastern Olympic Peninsula," Thesis for M.S., Univ. of Wash. 1946, page 32.

The Master of Science Thesis by Gregory Wheeler, Nov. 1971, Univ. of Washington titled :" Nuclear Power Plant Siting in North Clallam County, Washington: A study of geologic considerations for power sites along the northern coast of the Olympic Peninsula" describes geologic considerations for Low Point and other areas along the coast. We read: " Several prominent faults are present along the Strait ( See fig. 2). Though many of the faults plotted on the structure map are shown to have vertical displacements, strike slip displacements are common, though hard to document, since faults often parallel formational boundaries and outcrops are poor. The Lake Creek Fault is the major fault truncating the east end of the Clallam syncline. According to Brown and others ( 1960), this fault has a stratigraphic displacement of 2,000 to 5,000 feet. ." . and on page 15 : " Many minor faults were observed to offset Pleistocene glacial deposits along sea cliffs of the Strait of Juan de Fuca, indicating a Quaternary age of faulting. Seismic studies discussed in the next section of this report show that faulting has continued to the present day." Active faults are plotted on figure 5. " Faults are considered active if they are close to recorded earthquake epicenters and show signs of displacement of soils" ( page 18 ). " Large slump blocks occur along the sea cliffs, indicating instability of the cliffs. The slip surface is most often a clay layer in the Kitsap formation. The irregular clay lenses in the Kitsap formation may be lubricated by ground water, and must be studied in detail before construction begins." ) Pg. 31)

The EIS should discuss the placement of the tank farm in relation to the capacity of the soils to liquefy under earthquake conditions, in relation to the danger of slumping of the banks of the bluff at Green Point with the added weight of the filled tanks, and should give reference, if any is available, to the siting of tanks of the size proposed in other areas of the world which have comparable seismicity. What happens in an earthquake to the oil and the oil containment structures in a floating roof tank?

Your attention is directed to " Geophysical Investigation of the Southern Puget Sound Area, Washington" by Z.F. Danes et al, Journal of Geophysical REsearch Vol 70 No. 22, Nov. 15, 1965, page 5573. In the summary: " The Puget Sound lowlands are a deep crustal depression separated from the Olympic Peninsula by an active fault of about 4000 m throw. The basin is divided into three main parts by an igneous horst with an older gabbroic core and younger basaltic layers....Faults along the horst are active, the northern one more so. Surface geological work is hampered by a thick layer of glacial till." It is concluded that Northern Hood Canal developed along the major active fault that separates the Puget Sound lowlands from the Olympic mountains. Of course this is what NTPC wishes to cross now with its pipeline either the underwater line or the around Hood Canal routes being forced to cross it.

What are the implications of the Morse Creek fault for the pipeline reaching from the ship berths at Port Angeles to Green Point? What is the northward extent of this fault? How well ( with what certainty) can this extent be determined?

Another reference pertinent to geology in Clallam County was prepared by Dames and Moore, Nov. 15, 1972 titled PNW Nuclear Power Siting Study. The geology is dealt with on page 216 for a site near Blyn, just south of Protection Island. " Highly-faulted tertiary age bedrock outcrops immediately south of the Blyn site. The major Lake Creek Fault, 10 miles south of the Blyn site trends northwest-southeast and is about 21 miles in length as shown on the Geologic Map of Washington ( Huntting, 1961). Displacements of 2,000 to 5,000 feet are reported along this fault ( Mc Williams, 1965). Several

CONT

other faults have been mapped in the surrounding areas, which are not shown on the Geologic Map of Washington. The Dungeness-Gold Creek thrust fault lies about 12 miles west of the site and trends northwest-southeast for a distance of about 7 miles ( Lindquist, 1961). An inferred fault has been mapped that trends south of Port Discovery Bay as well as several other faults in the Quimper Peninsula Area ( Allison, 1959).... Although movement on these faults probably was initiated during those geologic periods, some of these faults are believed to be currently active today, in view of the earthquake activity within historic time." As to Seismology, Dames and Moore report: " Since 1840 some 42 earthquake epicenters have been recorded with intensities IV to VII within a radius of 40 miles of the Blyn Site. Of these, seven are within 20 miles radius. The closest epicenters consist of a cluster of four located about 6 miles south of the site ( three of intensity V and VI). The strongest local earthquake was of intensity VII in 1896, 23 miles to the west, just south of Port Angeles...The site is in an area that may experience a maximum intensity of VIII."

We have just been told that it is planned to route the underwater pipeline south of Protection Island. This is a relatively shallow area and is heavily used by fish migrating from inner Puget Sound.

Please give in detail the numbers, types and origins of these migrating fish and the impact to them of placement of a pipeline in this location. For starters see the 1971 Puget Sound Fall Chinook Tagging Study, March 1973 published by the State of Washington Department of Fisheries Management and Research Division, financed by National Marine Fisheries Service under Contract No. N208-0054-72 (N), Figure 3 on page 43 showing that fall chinook released at Discovery Bay after being tagged in that vicinity migrated to Capitol Lake near Olympia, to the Green River, Duwamish, Lake Washington, Ballard, SEattle, Snohomish, Port Susan, Hood Canal Hatchery, Skokomish River, ~~Hood Canal Hatchery,~~ Skagit Bay and Bellingham Bay.

A comparable study on Sockeye published by State of Washington Department of Fisheries, The 1971 Lake Washington Sockeye Tagging Study Final Report, National Marine Fisheries Service Contract No. NA 208-1168-N71 reported that scale analysis of the 1971 Discovery area gill net catch by the International Pacific Salmon Fisheries Commission indicated that Fraser River stocks ( mostly from the Early Stuart race) contributed nearly 10% of the gill net catch in that area. By comparison, the Fraser recoveries from the Admiralty tagging represent slightly more than 1.0% of the tags accounted for from that release group..." ( page 10).

This by no means exhausts our concerns with the Draft EIS. It is grossly deficient in more ways than we have time to tell you. Please consider the comments made by No Oilport and by Clallam County Task force and the questions they raise to be also our questions.

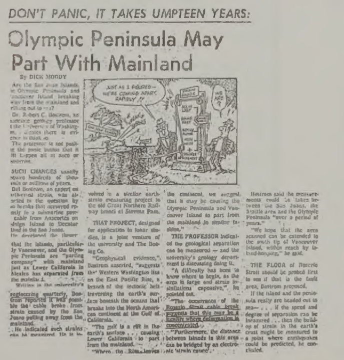
Thank you for the opportunity to comment.

Yours truly,

Eloise Kailin

Eloise Kailin
Secretary, Protect the Peninsula's Future
P.O. Box 1677
Sequim, Washington, 98382

Enclosure: Seattle Times Fri. April 3, 1964 article by Dick Moody, " Olympic Peninsula May Part With Mainland" describing rupture of a power cable between Anacortes on Fidalgo Island to Decatur Island in the San Juans.


JUST AS I FIGURED— WE'RE COMING APART, RAPIDLY!!
WE ARE ?

DON'T PANIC, IT TAKES UMPTEEN YEARS:

## Olympic Peninsula May Part With Mainland

By DICK MOODY

Are the San Juan Islands, [illegible] Olympic Peninsula and [illegible] Island breaking way from the mainland and [illegible] out to sea?

Dr. Robert C. Bostrom, an associate geology professor [illegible] the University of Washington, [illegible] there is evidence to think so.

The professor is not pushing the panic button that it will happen all at once or [illegible].

SUCH CHANGES usually require hundreds of thousands or millions of years.

But Bostrom, an expert on [illegible] strain, was alerted to the question by two breaks that occurred recently in a submarine power cable from Anacortes on Fidalgo Island to Decatur Island in the San Juans.

He developed the theory that the islands, particularly Vancouver, and the Olympic Peninsula are "parting company" with mainland just as Lower California in Mexico has separated from the mainland.

Writing in the university's engineering quarterly, Bostrom reported it was possible the cable broke from strain caused by the San Juans pulling away from the mainland.

He indicated such strains can be measured. He is involved in a similar earth-strain measuring project in the old Great Northern Railway tunnel at Stevens Pass.

THAT PROJECT, designed for application to lunar studies, is a joint venture of the university and The Boeing Co.

"Geophysical evidence," Bostrom asserted, "suggests that Western Washington lies on the East Pacific Rise, a branch of the tectonic belt traversing the earth's surface beneath the oceans that breaks into the North American continent at the Gulf of California.

"The gulf is a rift in the earth's surface . . . causing Lower California to part from the mainland.

"Where the Rise leaves the continent, we suggest that it may be causing the Olympic Peninsula and Vancouver Island to part from the mainland in similar fashion."

THE PROFESSOR indicated the geological separation can be measured — and the university's geology department is discussing doing it.

"A difficulty has been to know where to begin, as the area is large and strain installations expensive," he pointed out.

"The occurrence of the Rosario Strait cable break suggests that this may be a locality where deformation is concentrated.

"Furthermore, the distance between islands in this area can be bridged by an electronic 'strain gauge'."

Bostrom said the measurements could be taken between the San Juans, the Seattle area and the Olympic Peninsula "over a period of years."

"We hope that the area scanned can be extended to the south tip of Vancouver Island, within reach by [illegible]," he said.

THE FLOOR of Rosario Strait should be probed first to see if that is the fault area, Bostrom proposed.

If the island and the peninsula really are headed out to sea— . . . if the speed and degree of separation can be measured . . . then the build-up of strain in the earth's crust might be measured to a point where earthquakes could be predicted, he concluded.

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NO OILPORT INC.
POST OFFICE BOX 524 • PORT ANGELES, WASHINGTON 98362

April 2, 1979

Mr. Al Leonard
Bureau of Land Management

Dear Mr. Leonard:

Enclosed are the comments on behalf of No Oilport Inc. on the Draft Environmental Impact Statement Crude Oil Transportation System: Port Angeles, Washington, to Clearbrook, Minnesota (As proposed by Northern Tier Pipeline Company) January 3, 1979.

Under separate cover, legal concerns are submitted by No Oilport Inc. Attorney Craig Ritchie.

Several major areas of concern have not been covered nor reviewed because No Oilport Inc. is aware they have been covered by others. One example is air quality concerns. This has been addressed by local citizens, City/County Task Force, Olympic National Park, and EPA. In an effort not to be redundant, we will not address air quality in a detailed manner but rather place on record our concurrence with the many findings of total inadequacy of the current air quality studies.

Economics impacts both locally and nationally are addressed in two forums. The local City/County Task Force reviewed local economics and the Department of Energy reviewed it from a national perspective, including projected tariffs. Our comments on the latter will be submitted directly to the Department of Energy. We presume the DOE study, Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000, will be integrated with the final BLM Environmental Impact Statement, and that our comments will also be integrated in that manner.

The overwhelming comments expressed on the inadequacies of the Draft EIS before the BLM in the public hearing held in Port Angeles on March 15, 1979, leaves no doubt in our minds that the most appropriate procedure would be to release a supplemental draft EIS before moving into a final EIS. This need was accentuated further by an announcement by NTPC to amend their proposal for a cross Sound pipeline crossing as the primary route.

Thank you for this opportunity to comment.

Sincerely,

Norma Turner

Norma Turner
President
206-457-0151

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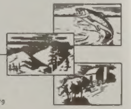
BOARD OF COUNTY COMMISSIONERS
Clallam County
State of Washington
PORT ANGELES 98362
Phone 452-3102



March 27, 1979

Ms. Norma Turner
President
NO OILPORT INC.
P.O. Box 524
Port Angeles, WA 98362

Dear Norma:

We appreciated receiving and reviewing the petitions bearing 8000 signatures from NO OILPORT opposing an oil port on the Olympic Peninsula.

It's significant indeed that the number of signatures you submitted is double that of two years ago. Clearly, there is growing concern and opposition to an oil port in the County by the citizens of both the City and County. Given that concern, it's highly appropriate that the area's local governments continue their strong opposition to the proposed siting of an oil port here.

Please keep us informed of concerns and problems as you become aware of them. The efforts of local volunteers in this matter are certainly commendable and impressive. We thank you and all the members of NO OILPORT INC. for your continued time and dedication in working for what so many believe serves the best interests of Clallam County.

Yours sincerely,

BOARD OF CLALLAM COUNTY COMMISSIONERS

Dick Lotzgesell
Dick Lotzgesell, Chairman

Ronald N. Richards
Ronald N. Richards

Harry L. Lydiard
Harry L. Lydiard

BCC:BGS:dld

cc: Governor Dixy Lee Ray
Senator Paul Conner
Senator Henry Jackson
Senator Warren Magnuson
Representative Don Bonder
Representative Andrew Nisbet
Representative Brad Owen
E.F.S.E.C.
Press

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BOARD OF COUNTY COMMISSIONERS

Clallam County

State of Washington
PORT ANGELES 98362
Phone 452-2102

June 1, 1977

Ms. Norma Turner
No Oilport, Inc.
P.O. Box 524
Port Angeles, Wa. 98362

Dear Ms. Turner:

This is to acknowledge receipt of petitions bearing the signatures of in excess of 4,000 persons opposing the establishment of an oil port in Clallam County.

Sincerely,

BOARD OF CLALLAM COUNTY COMMISSIONERS

Howard V. Doherty, Jr.
Chairman

p/d

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NO OILPORT INC.

POST OFFICE BOX 524 • PORT ANGELES, WASHINGTON 98362

COMMENTS ON THE
BUREAU OF LAND MANAGEMENT
DRAFT ENVIRONMENTAL IMPACT STATEMENT

CHAPTER 8

① 8-1 Objective number 1 does not include other inland states, but inland states are part of the "description of the proposal." Why are those states not considered in the objective?

② 8-1 "...faced with a declining supply..." Why is there not an objective to quantify the declining supply?

③ 8-1 ARCO reversal of the Four Corners Pipeline would dispose of some of the surplus Alaskan crude. It thus fits under Objective 2. What would be required to increase throughput to 140,000 bpd?

④ 8-2 Other energy sources are not addressed, yet in Chapter 1 projected energy demand made by PACE, the NTPC consultant, lists other energy sources to be used up to the year 2000. Why were all energy sources brought up for discussion in Chapter 1 then totally ignored in Chapter 8?

⑤ 8-2 Increased domestic production or reallocation of the existing crude oil supplies could meet local refinery needs, yet is not discussed. It would fulfill Objective 1, why is it not discussed? What is the current domestic new production and reopening of old wells in the Northern Tier states? What regulations would have to be changed for reallocation of crude oil supplies? What impact will the currently proposed DOE regulations (hearings held in March, 1978) to change pricing on new crude oil have on accelerating domestic production in such areas as Montana, Wyoming, and North Dakota?

⑥ 8-2 "Exchanges with Canada or Japan would also cause further U.S. dependence upon foreign crude oil supplies." NTPC plans to move approximately 50% foreign crude of a total of 1.28 MBPD to an area projected to need 1/3 to 1/2 that amount. Thus the project itself encourages high use of foreign crude oils. Do any of the project sponsors or their subsidiaries have interests in foreign oil or gas production? Would NTPC be a vehicle to move their foreign energy interests into the NT and IS?

⑦ 8-2 No action alternative notes it may cause the initiation of transportation alternatives or combinations of alternatives to meet the refinery and market demands. What are the "combination of alternatives" that would serve this purpose?

⑧ 8-2 Present transshipment through the Panama Canal might increase product costs to the ultimate consumers. The cost of crude oil at the refiners door includes all transportation costs and must be competitive with all crude purchased. How are increased transportation costs reflected in consumer prices when the cost is directly related to the world market value set by OPEC?

⑨ 8-2 "A delay in permit approval for the NTPC proposed action might affect the implementation of other alternative proposals." What specific alternative proposals? If they are implemented, will NTPC then not be needed?

⑩ 8-3 Port Angeles and Low Point are noted as the "most desirable oil transshipment ports with the onshore pipeline passing around Puget Sound to North Bend." (emphasis added) This means then that it is more desirable from an oil spill standpoint than the underwater pipeline alternative?

⑪ 8-3 Operation of a 20-mile submarine pipeline "would increase the risk of marine oil spills." Please quantify. What documentation was used?

⑫ 8-4 Please define in specifics the "major public" opposition to the Stampede Pass route segment.

8-4 Coeur d'Alene route--how much "public opposition"?

⑬ 8-5 "Only those viable alternatives capable of utilizing the east coast crude oil surplus to meet the demand in the Northern Tier states were given final consideration;" What is the projected demand in the Northern Tiers for the Alaskan-type crude oil? The description in Chapter 1 mentions inland states, yet here again the inland states are not part of the consideration. Why?

8-5 Foothills, Kitimat and TransMountain are now all active proposals under Title V.

⑭ 8-6 "Critical environmental impacts" are associated with the SOHIO project from oil spills, air quality and land disturbances. How does "critical" differ from "adverse" and "major"? Why is this the only proposal with "critical" impacts?

⑮ 8-6 How does the statement of no spare capacity in the mid-continent system through 1980 fit with the DOE report of February 21, 1978, and the figures on page 8-113?

⑯ 8-7 Is the Northville Industries port at Puerto Armuelles completed? If not, when is the new projected completion date?

⑰ 8-7 "The no action alternative would foreclose the opportunity of supplying the Puget Sound refineries from the North Bend area." It does not preclude service via existing pipeline from either resumption of Canadian crude or exchanges. The one negative statement leaves the reader believing this project is the only means of supplying Puget Sound refineries via pipeline--which is not true.

⑱ 8-8 "without the NT proposal the excess west coast supply of crude oil would continue unless production of Prudhoe Bay were curtailed to equal west coast demand." What about SOHIO? Exchanges with Japan? ARCO Four Corners reversal? Kitimat? TransMountain? Foothills? Transshipment through the Panama Canal? ETC. In other words, the statement is incorrect. Without NTPC, the Alaskan crude oil surplus on the west coast would be moved via another alternative.

⑲ 8-10 Air quality was calculated assuming bunker fuel would be limited to 1.0%. Where is bunker fuel of 1.0% or less available? Are there current federal or state regulations requiring use of 1% bunker fuel in Washington State? What agencies would monitor bunker fuel use?

⑳ 8-12 "Many of the river crossings are within 5 miles of Puget Sound, so with a pipe rupture, oil would probably enter the marine environment." (emphasis added) Please quantify underlined portion of that statement. What is the probability of an undetected spill of less than .5% (up to 200,000 gallons per day at maximum throughput) entering the marine environment? Or contaminating groundwater supplies?

㉑ 8-12 & 8-13 For both construction impacts and oil spill impacts, trout would take "several years" to return to normal and the salmon cycle may take "up to 20 years" to recover. Please quantify that impact in financial terms. What is the potential economic loss of 20 year's interruption of the salmon cycle?

㉒ 8-23 Figure 8.4.1.2-2 Trajectory oil spill. Again please quantify the amount of oil in the projected spill. None of the trajectory spill figures notes the amount of oil spilled, thus making it impossible to know if this is a "worst case" or "best case" scenario.

㉓ 8-54 "No information is available on oil spill trajectories for underwater pipeline ruptures on the Whidbey Island-Camano Island leg of the submarine pipeline." Will this be supplied in the final EIS now that NTPC has opted for the cross-Sound alternative?

㉔ 8-27 Onshore storage would require 140 acres. Yet 8-37 notes 294 acres and 8-42 notes 300 acres. What is the minimum acreage required for an onshore storage facility for 13 million barrels?

㉕ 8-29 "highest concentration (air quality impacts) would occur several miles to the east of the SPM site." How many is "several"? What landfall areas would be impacted?

㉖ 8-29 & 8-37 "No ozone modeling was performed for this alternative port site." (Low Point and Freshwater Bay) Now that TransMountain has opted for this area will ozone modeling be done?

㉗ 8-32 Construction would impact the water table level and groundwater movement. What mitigating measures will be used to assure residents on well systems of adequate and uncontaminated water supplies during construction? And during operation?

㉘ 8-32 "Population reductions would probably not be noticed in the ocean sport, commercial, or Indian fisheries..." Explain. It would most definitely affect Indian fisheries with the hatchery on the Elwha River.

㉙ 8-36 "The pipeline route would traverse 1/4 mile of ONP." Would this require a special permit? If so, where and how would it be obtained?

㉚ 8-36 "No known significant impact to recreational activities..." and, two paragraphs later, "impacts to recreation would be experienced from roughly Pillar Point to Freshwater Bay." Aren't these two conflicting statements? It again points up the need to QUANTIFY impacts rather than use "no significant impacts" etc.

㉛ 8-37 Lower Elwha Indian Reservation would be substantially impacted. What does that mean? Can "substantially" be differentiated from "significant"? Which is the greater impact? Can they be quantified?

㉜ 8-37 Electric onshore storage facilities pumps "noise would generally be audible at distances of less than 3000 feet." What db level? Do pump stations have buildings around them? The drawings do not seem to indicate that there are buildings. Why is it in earlier discussions (pages 8-19 & 8-29) the db level never exceeds 70, which just happens to be a legal limit? What db levels have been recorded in the TAPS project?

㉝ 8-38 "The eastern portion of the pipeline" is in a Seismic Risk Zone 3 (maximum earthquake damage expected). (emphasis added) Please define in specific geographical terms the vague term underlined above. How many miles does it include?

8-38 "...seismicity and slope instability problems have not been identified." Does that mean they have not been studied?

㉞ 8-39 Maps II-2 through II-10 map addendum are used as reference sources for marine resources. Page 8-42 states halibut spawning grounds are off Crescent Bay, Port Angeles, Green Point and Dungeness Spit; yet when one refers to the maps above, no halibut spawning grounds are noted on any of the maps. Why not?

㉟ 8-42 With an oil spill at Low Point "...heavy mortality to herring roe could occur..." Yet the map of marine resources (page 41 addendum) does not show any herring spawning grounds in the Strait of Juan de Fuca! Are there herring spawning grounds west of Sequim Bay? Where? Map needs to be corrected.

㊱ 8-42 A list of species located in this area, Douglas Fir, etc. What studies have been done on these species susceptibility to hydrocarbons and other pollutants? Sierra area near Los Angeles has certainly been negatively impacted.

㊲ 8-42 Cultural resources. Why are the areas readily impacted by an intransit spill not listed; ie. Point of Arches, Ozette Archaeological dig site?

㊳ 8-43 "The notch cut for the pipeline through the bluff should have an impact similar to the proposed cut at Green Point." The notch at Green Point is projected to have a negative impact on Dungeness Spit by changing the siltation pattern. Does that mean the Low Point notch would also possibly affect negatively the shoreline east of the notch?

㊴ 8-44 It was assumed for oil spill risk analysis that the 125,000 dwt ban east of Port Angeles did not apply. Was there an analysis also then done within the confines of reality (ie. tanker ban east of Port Angeles for 125,000 dwt)? If not, why not?

㊵ 8-44 Tank farm oil spill risk was not done for 13.6 mb even though that number is specifically mentioned on page 1-12. Why was it not analyzed?

8-44 Computer simulation for waterway navigation was done. By whom? An individual, a team, OIW, Coast Guard, etc.?

8-44 "The exposure variables are distance traveled and port calls per year." Who set the criteria for exposure variables? Why was there no consideration for such factors as ship traffic congestion, weather, historical data on collision, etc.?

㊶ 8-45 Table 8.4.1.6-3. Why were the estimated pipeline spill frequencies not given in terms of a single base pipeline mileage rate? Burrows Bay is listed as "not applicable" pipeline, yet page 8-18 notes a submarine pipeline will be used in this alternative from terminal to shore. Burrows Bay then should be listed for offshore pipeline risks. This table is invalid for ranking unless a common base rate is used.

㊷ 8-45 Table 8.4.1.6-5 demonstrates that the shorter the pipeline mileage the less the projected risks. How? The text notes it is an accumulation of all factors, yet the table itself only lists pipelines, thus leaving the impression it is pipeline-only related.

㊸ 8-45 "Locating large storage tanks in the vicinity of the Fairchild International Airport could be considered a hazard to air traffic." The terminal with 80' towers, 10,000-barrel storage tanks on the platforms, tankers, etc. may well pose a hazard to air traffic at the Coast Guard Base. Why has that not been addressed? (emphasis added in quote above)

㊹ 8-47 "Options for the property acquisition were obtained from July to September 1976." (emphasis added) How many options and for how many acres were obtained before the Clallam County Comprehensive Plan amendment was adopted?

㊺ 8-47 Site 3 is a 545-acre site "suitable for construction of onshore tanks and other related facilities." (emphasis added) What are other related facilities? What would require acquiring almost four times the necessary acreage for onshore facilities listed for other alternative sites?

㊻ 8-47 Submarine pipeline may not comply with the Clallam County Shoreline Master Program. If it does not conform, what will happen? What regulations will come into play? Will the pipeline be forced to move, change engineering plans?

㊼ 8-47 Of the four sites listed as onshore tank farm sites, two sites (#1 and #2) were eliminated. One was chosen as the present proposed site, thus leaving only one site as an alternative tank farm site. The one site left is attached to the present acreage. Clallam County courthouse records show there are other areas of adequate undeveloped acreage within the ten-mile radius of the proposed port. More tank farm site alternatives need to be listed.

㊽ 8-48 Table 8.4.1.8-1 is difficult to read and use due to light print and small print. Why is there no mention under land use of conformance, or lack of same, to current land use plans (ie. comprehensive plan, shoreline management plans, etc.)? Under topography lists 140 acres for the Port Angeles site, the proposal states that 242 acres of the 294 acre site will be used (page 1-11). Four columns later, the same chart notes "most of the 294 acres would be cleared." Why the inconsistencies? Aquatic resources should note the potential impact of sedimentation on spawning areas may affect salmon up to a 20-year cycle.

㊾ 8-49 Proposed pipeline route was selected due to a number of factors including avoidance of Indian Reservations, avoidance of special Federal lands and public preference. Why were Indian Reservations and Federal lands avoided? Were the environmental problems created there greater than the areas selected? If so, what specific problems would have been generated? Define "public preferences." How is public preference gauged? Poll? Public forums? Is legislative action political preference or public preference? What factors were used to opt for the cross Sound pipeline crossing? The preference according to 8.4.2 was for the around Puget Sound routing. What new specific factors changed NTPC emphasis to the cross Sound routing? Does public concern regarding the around Puget Sound routing mean the preference is elimination of NTPC project altogether, moving it further east or west or cross Sound pipeline? Obviously, opposition to one routing cannot be translated automatically into preference to another. In the final EIS, please specifically note what public preferences endorsed the cross Sound pipeline prior to March 20, 1979.

㊿ 8-49 "The following material is in part adapted from the NTPC application for certification made to the Washington Energy Facility Site Evaluation Council in 1978." (emphasis added) Despite the disclaimer, the reader is never appraised of exactly what "part" of the environmental analysis comes directly from the project proponent versus independent consultant. Without such notation, the entire section of environmental analysis of 8.4.2.1 is useless.

(51) 8-49 Residents with 4000' of pipeline construction would "experience a noticeable increase in noise levels." Up to what levels? What are the current baseline levels? Quantify "noticeable increase."

(52) 8-49 Noise of construction "would be limited to 5 days or less." Does this mean for the cross Sound pipeline the construction crew will only be working 5 days onshore? What about the stockpiling area? Where will it be located? For what duration? What noise level is expected?

(53) 8-49 Several questions have been raised concerning the pipeline notch for the proposed Green Point tank farm. What problems may arise from the 40' bluff of Port Williams and the 100' bluff near Point Partridge and the pipeline descents and ascents?

(54) 8-49 "There is no subbottom information available for Saratoga Passage." Will it be provided for the final EIS?

8-50 "No impacts to the marine geology have been identified." Will they be identified for the final EIS? There is no construction plan to allow for analysis of whether or not there would be impacts on the marine geology. The lack of specific construction technique is no surprise when NTPC has not even decided on how to install nor where to place the significantly shorter submarine pipelines from terminal to tank farm (page 1-11). Will specific construction plans and exact location be required for the final EIS?

(55) 8-50 "In about five locations public water supply areas are located near this alternate route." Exactly what five are they, and how close is "near"?

8-50 "Construction on this route is not expected to impact quality or quantity of any groundwater for municipal supplies." (emphasis added) After reviewing reams of NTPC material, this must be an example of material lifted from NTPC. Explain how stream pipeline crossings and submarine pipelines will create turbidity, damage fish cycles up to 20 years, and yet pipeline construction in aquafirs will not impact municipal supplies. What information source provided the last sentence of page 8-50?

(56) 8-51 "The total salmon contribution to various sport, commercial and Indian fisheries of streams along this route is nearly twice that of streams crossed in the proposed route." Please give source of this statement and supporting documentation.

(57) 8-51 "There is the possibility of a pipeline rupture caused by anchor dragging." How much of a possibility? Can it be quantified? Are there any statistics by Coast Guard or other agency recorded on incidents of anchor dragging in the area of proposed pipeline crossing?

(58) 8-52 Figure 8.4.2.1-1. What volume of spill is used?

(59) 8-54 Laying of submarine pipeline would severely impact water quality in Skagit Bay and in Saratoga Passage. How would this impact the intertidal clam bed and shrimp of Saratoga Passage and crab in Skagit Bay? What economical losses would be sustained?

(60) 8-54 "A submarine pipeline spill would significantly degrade the water quality throughout the eastern part of the Strait of Juan de Fuca...commercial salmon fisheries would be significantly impacted in most areas of the eastern part of the Strait." (emphasis added) There are many estimates available through Washington State Department of Ecology, Department of Fisheries, etc. of values in Puget Sound for fisheries, recreational property, etc. What quantitive amount can be attributed to a "significant" degradation of water quality mentioned above? What precise geographical boundaries are there for the "eastern part of the Strait of Juan de Fuca"? What economic loss would be projected for a significant impact on the commercial salmon fisheries?

(61) 8-55 "The alternative route would probably follow existing corridors wherever practical." (emphasis added) Who decides what is practical? Does eminent domain establish any criteria for "wherever practical"?

(62) 8-56 "A provision is made for utility corridor, which includes pipelines." If NTPC does not serve Washington State does it qualify as a utility in the counties it will pass through?

(63) 8-56 Recreation Resources. Losses from an oil spill are extremely general and vague. Will they be quantified in the final EIS?

(64) 8-57 Social and economic conditions. Does not state how long the construction crews would be in Clallam and Jefferson counties. How long is the "early pipeline construction phase"? "Non-local construction workers would be about 500." How many local construction workers would be needed? What is the terrestial impact of parking for over 500 workers in the Port Williams area?

(65) 8-57 "Construction costs would be about $9.3 million greater..." NTPC publicly stated it will cost between $10 and $15 million more in March, 1979.

(66) 8-57 "Construction of the pipeline across this watershed (Green River) would obligate the City of Tacoma to implement oil treatment facilities of the municipal water supply system." (emphasis added) Would other municipalities have the same obligation if the pipeline is constructed across their watershed?

8-60 to 8-97 Not reviewed

(67) -98 Delta Junction. If 300,000 bpd is diverted from the TAPS line at mile 545, how will that affect the tariff rates on the Alyeska pipeline? Will the decreased throughput in the last approximately 300 miles yield a new cost-per-barrel mile figure?

(68) 8-105 Environmental analysis for TransMountain alternative is based on "Information provided in the TransMountain Pipeline Project - Environmental Assessment Volume II (ARCO 1977)." Is this document from the project proponent? If yes, will independent consultants be used to assess the environmental analysis in the final EIS?

8-105 "When the full reversal phase is completed, TransMountain could supply 230,000 barrels per day to the Puget Sound refineries." Why is this not mentioned under the no action alternative for NTPC? Page 8-7 refers only to serving the Washington State refineries via North Bend (where there is no connecting pipeline) but ignores the possibility of using the TransMountain.

8-108 TransMountain is now filed under Title V.

(69) 8-109 How much acreage will be used for the SOHIO tank farm?

8-109 What is tank farm acreage requirement for TransMexico pipeline?

8-110 What is the acreage requirement for the tank farm for TransGuatemala pipeline?

(70) 8-111 For the Jones Act fleet "220,000 dwt tankers may be available in 1978." (emphasis added) Are they available now in 1979? If so, how many? Who owns them? Where are they currently being used?

(71) 8-112 "The Chicap Pipeline is expanding capacity to about 490,000 bpd which should be completed in August 1978." (emphasis added) Is this completed?

(72) 8-112 Williams Pipeline expansion to allow moving 120,000 bpd is scheduled for completion August 1978. Is this completed? What volumes are they currently moving?

(73) 8-113 What is the current status of the Williams Bros. proposed expansion to Wrenshall area?

(74) 8-113 Did Explorer Pipeline increase to 145,000 bpd throughput in August 1978? If not, when? "The system can be expanded to provide a total of about ...235,000 b/d to Chicago." What would be required to expand to 235,000 bpd?

(75) 8-113 "Amoco is considering a 200,000 to 600,000 b/d extension to the Texoma line from Cushing to Chicago." What is the current status of this proposal? Cost? Permits required? Will they require contracts for purchase of crude before proceeding?

(76) 8-113 "Expansion of the Mid-Continent network would require substantial new construction of pipelines." How much of the expansion would occur in pre-existing pipeline right-of-way versus 1557 miles of all new pipeline ROW for NTPC?

(77) 8-113 "The existing United States port facilities already exceed most Federal air quality standards and additional through-put could be expected to exaggerate the existing situation." Existing situations present opportunities for air quality trade-offs, such as the one agreed to by SOHIO in Long Beach, whereas new port facilities such as Port Angeles do not encourage such trade-offs. In the national picture, which is environmentally more sound--siting in existing ports to force trade-offs or creating more new non-attainment areas?

(78) 8-113 Northern Pipeline is well along in the permiting process. Why is not more discussion of this proposal being done? It constitutes part of a series of alternatives that could substitute for NTPC.

(79) 8-114 The Panamanian Transshipment Port was scheduled for completion by December 1978. Is it completed?

(80) 8-115 Will alternatives be compared on an economic basis in the final EIS? DOE report should facilitate such a comparison.

Additional Comments

(81) 2-32 Table 2.1.1.13-1. A phone call February 1, 1979, to Mr. Glenn Wallace of BLM resulted in discovery of several problems with this table. The source is Corps of Engineers 1977, yet the title notes 1978 use; it should be for 1977 or 1976. Mr. Wallace noted some columns had been left off and, as such, the table was not useable. Tankers should be defined. Tankers under self-propelled vessels are ocean-going tankers, and tankers under non-self-propelled vessels inbound are tanker barges.

(82) 1-57 NTPC plans to establish procedures to utilize 1% sulfur fuel for in-port activities. Final EIS should reflect that NTPC, in a letter of March 15, 1979, to Coalition Against Oil Pollution, states "The upcoming submittals to EFSEC by way of amendment to NTPC's application will provide for the use of low sulfur fuel with a sulfur content of .45% or less by the tankers while they are in port." (emphasis added) Where is .45% sulfur fuel, or less, available? What specific areas? How will this be enforced? By whom? With what penalty for violations?

(83) 1-3 Pace is used for several energy figures. Why are they so heavily relied upon when they are a NTPC consultant? Preliminary BLM draft noted Bonner and Moore as well as Pace, and noted Pace data was useful as a "general indication of supply conditions." (emphasis added) (Page 2-327) If it is to be used as only a general information source, there are several other similar sources available.

(84) General Comment: Total lack of discussion of secondary impacts (ie. refinery and/or petrochemical plants) likely to be associated with the pipeline. Evidence presented by Paula Doherty in public testimony to BLM in Port Angeles on March 15, 1979, documents why this is a strong possibility and must be discussed in the final EIS.

(85) 3-7 Discussion of abandonment makes no reference to change in air quality, yet the preliminary draft BLM study (page 3-100) noted the abandonment will mean air quality improvement which might permit industrial expansion. Why was the preliminary draft statement deleted from the current EIS?

(86) 1-58 Stockpile location. Where will the stockpile locations be for the cross Sound pipeline alternative?

(87) 1-60 "The applicant must file a statement with EFSEC...certifying that the proposed project is consistent with the program..." meaning State Coastal Zone Management Program. Has such a statement been filed with EFSEC? If not, why not?

(88) 2-46 Notes that OPEXA has obtained 1000 signatures supporting the NTPC proposal. Attached are two letters. One from the Clallam County Commissioners dated May 1, 1977, acknowledging receipt of over 4000 signatures opposing an oilport on the Olympic Peninsula; and the second from the Clallam County Commissioners acknowledging receipt of approximately 8000 signatures opposing an oilport on the Olympic Peninsula. All petitions were circulated by No Oilport, Inc.

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CONT

## DETAILED COMMENTARY ON BLM DRAFT EIS, NORTHERN TIER PIPELINE

From: Eloise Kailin for No Oilport, Inc.

### Chapter 1 : Description of Proposed Action

1-1 Inland markets: Please specify the market area and indicate what contracts already exist for use of the oil ( customers of Northern TierPipeline Co.). Specifically what is the firm demand for the high sulfur Alaska product? Further, what is the demand for foreign oil at the anticipated cost of delivery? Please give in technical addendum the full basis for costs of both types of oil delivered to pipeline customers.

The full extent of the project involves not two but three tanker berths, pipelines, etc. The final EIS should reflect this in all aspects of its EIS. Page 1-1 mentions " and ultimately 933,000 barrels per day" which gives an erroneous picture since an EIS is supposed to reflect the full extent of a project.

Delivery facilities to other pipelines: what agreements or contracts exist to allow connections to Glacier, Western Crude, Amoco, Lakehead and Minnesota pipeline systems or is this another of NTPC's pipedreams? Does "access to 50 refineries with a capacity of 3.6 million bpd" define the ultimate extent of this project? If so, please calculate impacts for THIS figure. If not, why is it mentioned?

1.2: Purpose Background: Add to the discussion the new discoveries of natural gas and the Dep't. of Energy request that users of oil switch to GAS as far as possible. At the point of use the switch would obviously improve air quality which would be a benefit of not facilitating the NTPC project and should receive discussion somewhere in this document. Balance of payments problems will not be helped by import of foreign oil, an integral part of this proposal, and this should be weighted as a cost of this project.

Please give source for the statement that production is declining in " Northern Tier, Rocky Mt. and Midwest regions" in spite of Williston Basin and S.W. Wyoming production, and indicate whether this is for reasons of physical availability or has to do withmarket relationships and contracts. Give the indiginous production for each of these market areas and the exports out of each of these areas to other markets.

The Dept. of Energy study, released Feb. 27, 1979 was referred to from drafts made specially available [illegible] but not available to the public. This Draft EIS does not present a fair transmittal of the major thrust of that document, namely that the shortfall in oil supply to the northern tier states will be only a fraction of that stated by proponent of this project. In light of this and other indications in the document ( using proponent as source for a very large part of the data even when other sources would be available such as the sulfur oxide output of existing industries in Port Angeles) the document must be considered to be unfairly biased in favor of proponent's project.

1.3 Authorizing Actions: Should state that there is vigorous citizen and local governmental opposition to the oilport at Port Angeles with the tank farm being in clear violation of the County Comprehensive Plan. The statement that the various governmental entities " might have requirements that would have to be met before construction" grossly understates the level of opposition here and gives basis for a further charge of bias, particularly since this point has been presented to BLM repeatedly and is recognized elsewhere in the document.

1.4. Proposed action. The ultimate is not 933,000 but 1,283,000 bpd. See sec. 6-4. Include the full project with : 511 tanker calls/yr, Class I standards violated 6 to 7 days/ yr in Olympic National Park, excessive sulfur oxide levels violating the Prevention of Significant Deterioration standards of the Clean Air Act on 32 days/yr, one oil spill every 2.3 years for tankers in transit and every 3.9 years for spills at berths, a barge spill every 0.91 years, 1,022 port calls a year for fuel barges. Note that the historic record of spills into Puget Sound show that 78% of the spills there have been from barges.* The maximum size of the tankers and the size mix of tankers at the fully developed state of the project should be presented. We should be prepared for an explosion in the harbor every 4.69 years and a fire every 9.18 years [illegible] a bleak prospect that poses special problems since the only hospital for 46 miles around sits almost at the edge of the harbor entrance, less than 200 ft. from the water.

All Marine Accidents 1968-74, Puget Sound

| | |
|---|---|
| Barge spills | 77.6 % of all oil spilled ( 625,496 gal) |
| Tugs | 18.3% |
| Fishing vessels | 3.9% |
| TAnkers | 0.2% |

Source: Col. Weichert, Clean Sound Corp., to No Oilport!, Feb. 15, 1977

1.4 cont'd. Booster Pumps, electric: indicate electricity consumption for 10,000 H.P. motor. Give also total power requirements for the 1.283 million bpd throughput. Indicate size of the bunkering facility, numbers, sizes and other data pertinent to the tugs, volumes of fuel consumed by tankers and all ancillary vessels and servicing needed for these. What protection will be done to contain or mop up spills? How is the bunker fuel heated? Describe handling of toilet wastes. Give source of the bunker fuel and relate to spill hazards.

For the diesel emergency generator: what is the past experience with frequency of use? Duration expected in hours of use per year? How frequently is their functional state tested? What is the noise factor at the site boundary? The air pollution at the site boundary? What is the size of the diesel storage tank and how much of its vapor reaches the air?

What size fire can be handled by theequipment described? What would be the likely extent of the damages for a fire outside the ability of local equipment to control it, considering thelong steaming time for equipment coming here fromthe Seattle area? What will happen to fire insurance rates for industries sharing the harbor? For residences in the vicinity? Has proponent committed to paying the increased premiums?

The separator for runoff and oily wastes: how much dissolved oil will be discharged into Port Angeles harbor? What is the total volume of such oil-contaminated effluent? What toxic substances are present ( e.g. benzene and other toxic hydrocarbons).

Submarine pipelines: At a throughput of 1.283 million bpd how much time will the pipeline from berth to storage tanks be inactive? Give backup data and supporting studies for the statement that leaks as small as 50 to 100 bbl. could be detected. In actual practice how often are leaks of this size spotted? What is the theoretical liklihood of a small leak occurring at night when it probably could not be detected early? In terms of bbl. of oil spilled, how much would likely escape if a large rupture occurred at a pumping rate of 100,000 bbl per hr a) daytime and b) night? What is the expected "downtime" and what is the accuracy of measurement expected for the monitoring equipment ( flowmeters, computer). When this equipment is non-functional is the port to be closed down? How large a spill would be detectable by the simultaneous monitoring by computers on the amount of oil sent by the pumps and that showing on tank gauges? What is the "normal range" of variation permitted? When this has been calculated, please then give the amount of oil which could escape undetected. Include a reasonable response time on the part of the dispatcher.

How is oil in a ruptured line " taken out" a) if the rupture is near the east end of the submarine line and b) if the break is at the west end? Is there suction capability at each end?

We are told it is common practice in this harbor for ships to drop anchor near the mouth of the harbor to help bring the vessel to a halt. What studies have been made of anchor penetration into the harbor bottom? If this has not been done, what is the basis for determining depth of pipeline placement in the harbor? What burial depth is currently planned for these cross-harbor lines?

Onsite storage, Green Point: How many tanks will be used for 1.283 million bpd? Show in fig. 1.4-3 how they would be arranged. What water-proofing ( oil proofing) material will line the basins surrounding the tanks? Give total volume of storm run-off for the fully developed facility ( 1.283 million bpd) and describe the amount of oil which will be discharged after the oil-water processing. This should include the OIL DISSOLVED IN THE WATER. Where is this discharged? What are the long-range , life-of-project to end point of oil-degradation, effects on the environment of such discharges?

If compacted soil or clay is to be used for the basin linings, give the amount of oil escaping into the ground on an annual and life-of project plus final oil degradation basis. Discuss possible contamination of groundwater resulting from this.

What is the reliability of densitometers? Discuss the probability that oil from a common source might occur in successive batches, and the probability rate for a situation in which the control center is not alerted to dispatch of oil from a tanker. What is the historic record of human failure with regard to pipeline storage facility malfunctions? What size seismic event would be tolerated by these 285 ft x 56 ft. high tanks? By the juncture of the subterranean pipes with fixed facilities at the berths and on land? Along both subterranean pipes and on land pipes? What is the historic record for seismic failures in these various categories? Is diking sufficient for containment of more than one tank's contents?

What is meant by " to minimize hydrocarbon vapor emissions" when there can be no vapor recovery system as the floating roof descends exposing an oil-wet wall of the tank? Please describe each major type of oil to be handled with regard to chemical nature of all volatile hydrocarbons and the proportion of each in the vapors at 100 degrees F., hydrogen sulfide and other contamination odorants, and give theReid vapor pressure for each of the major crudes. What will hydrocarbon vapor losses be from standing tanks on a hot windy summer day, assuming that Alaskan oil will be at full production and emerging at Valdez with a temperature of about 109 degrees F.? What will vapor losses be if this is combined with tank draw-downs accompanying maximal delivery for the FULL size project from tank farm to cross-continental pipeline?

Discuss water run-off for the fully developed 1.283 million bpd project. Add To discussion of oil permeability and oil-in water permeability of the diked areas.

Foundation bearing characteristics for the tank farm should already be known partially from analysis of core samples. Where is this data? Is this Vashon Drift material or something else? Such data belong in an urgently-needed Technical Addendum.

What disposal will be made of effluent from laboratory sinks? What toxic materials other than oil will be discharged from this source?

In discussing surplus excavation materials and control of erosion please describe quantities of sediment likely to escape the site into Siebert Creek or the Straits. How will reasonable limits for erosion be set? How monitored? What provision will be made for enforcement of this ( will a performance bond be posted?) ?

What route will the power lines take to the substation at the tank form? What will the visual impact be for this? What will be the land commitment for this corridor? Will there be any cost to the P.U.D. for such installation over and above what is paid by proponent? Describe the emergency diesel generator: how big, how noisy, what emissions? Give the latter qualitatively and quantitatively. How often is this equipment operated aside from emergencies, to check on performance?

Fire: What is the volume held by the water tank? What is the distance between and water volume capability of hydrants? What is the placement interval and capacity for foam chambers on top of the tanks? How effective have these proved in actual use? How many portable dry chemical units and what size? Any insulated fire-fighting suits available? How many? How large a fire truck with what capabilities? How well trained a crew? Are foam trailers provided? If so, how many and what capacity? Describe the manpower available and equipment available from off-site firefighting sources a) within 30 min., b) within 1 hr. c) within 2 hr. of an emergency call.

Water: How much is available from the local water district for daily use and for emergency use? Why, at this late stage of the EIS process has not the feasibility of a water supply been determined? How many gallons/minute are available from local wells and at what depths/? Will emergency lines be run to Siebert creek or the Straits for fire fighting water?

Soils: Where is the Soil Conservation Service analysis for soils intended to be used for sanitary sewage disposal? Will laboratory wastes be added to this system? Where is the Health Dept. permit for the septic system? What sanitary landfill will be used for sediments from oil/water separators and are permits available in the County for this? How about other counties along the line where similar tank farms are to be placed? Describe the leaching of oil and other toxic components from the disposal site soil and any groundwater contamination which could result. What quantities of such waste are contemplated?

Security: will the gates be guarded? Will the guards be armed? If so, state the qualifications of the personnel to be so armed.

Pipeline System: Note ultimate capacity of 1.283 million bpd. What width of pipeline right of way? Which side of BPA Right of Way across Clallam Co.?

Pipeline: What stresses in lb./sq. inch are present in the normally operating filled pipeline at the peak impulse of pumping at the bottom of the longest decline in the entire system ( 1500 + miles)? What will the stresses be at maximum from temperature effects of extreme weather? From ground settlement? From seismic shifts? What kind of pressures are encountered from avalanches in mountain passes? From landslides? Describe rusting and corrosion of the grade of steel to be used in terms of corrosiveness of soils to be traversed and in terms of corrosiveness of types of oil to be carried, interpreting these so one can tell about how long it will be before the first corrosion leak occurs, and so that it is possible to know how long the pipe can carry the stresses mentioned above. Will welds be X-rayed? How are records kept and how are they monitored? Will there be publically available results of such testing? Why is not double walled piping required for all river and stream crossings with an alarm system to detect breach of the outer pipe wall? How is pipe protected when it cannot be buried below the scour depth of a stream or river? Which streams and rivers are affected by this condition? Where are the references and background data for scour depths of all rivers and streams to be crossed? This should be included in a Technical Addendum. When a stream is not named, as Eagle Creek or Jorstad Creek, in your list of streams and river crossings does that imply no special pipe will be used in those places? If so the EIS should include the downstream outflow points of such streams as areas especially at risk and point these up under environmental costs with a relatively high cost factor. Major estuaries are fed by such streams and many of the rivers crossed and are tremendously valuable for food production. There is no substitute area on the Pacific Coast for Dabob Bay to raise oyster seed. Should it become oil-fouled the economic and environmental damages would be very high.

A full environmental cost analysis of the project needs to be made for both normal operation and life-of-project probable spill damages and this should be added to other costs and benefits of the project for an overall cost/benefit assessment before any public agency makes a decision irretrievably committing public resources.

What is the magnitude of induced voltage that could exist in a multiple use pipeline corridor ? What are the effects if any on the pipe wall, on soil organisms, on burrowing animals, on plants and on wildlife from such currents? Is the build up sufficient to cause a shock to man or animals? To have a heating effect? To interfere with radio or TV reception? What are the effects of the cathodic system to plants, soil organisms, burrowing animals, wildlife and man from the cathodic pipe protection system?

Pumping Stations: How many will be needed for 1.283 million bpd? Do they run through the night? Describe noise shielding to be used and maximum noise at the property fence for each station both for the project and for current background levels. How many residences will be affected by being able to hear each of the pumping stations?

What size drainage system ( to receive oil drained from pumps and piping) is present at the pumping stations? What is the maximum size leak which has historically occurred at comparable pump stations? Since these are un-manned, give the probable personnel reaction time to respond to a leak at each station, taking into account time to reach a responsible person and get him there, and how this might be modified by bad weather, snow, ice. What would the worst case situation add up to in oil spilled? When block valves at such stations are closed how much oil could still escape?

Please give the power requirements for a 1.283 million bpd throughput in text or Table 1.4-14.

Construction Schedule: How is this to be modified by changing plans of NTPC? With major revisions in plans as for an underwater crossing of Puget Sound, large parts of the EIS will have to be revised. Table 1.4-17 would need complete revision for Washington state.

Page 140: Explain how welds can be inspected and tested for the lay-barge method of construction and any imperfections corrected in timely, before pipe is oil filled, fashion. What provision is made for oversight of crews? Can pipe be retrieved if it has a faulty weld and is laid underwater?

The construction of a launchway ramp through the bluff at Green Point, 1-40, should be given in detail with discussion of long range effects of any construction left in place on littoral drift and transit of feeder material to Dungeness Spit, and to displacement of fish migrating along the shoreline. The same considerations apply to pipelines as an operating entity with the addition of local temperature effects on fish and plant organisms from the hot oil going through the pipe.

Parking lot construction, roads and other structures should be described relative to amount of silt during construction and stormwater carried silt, road oils, toxic materials as benzalpha-pyrenes, heavy metals and coliforms, giving quantity of each and final deposit of such materials in the environment. It should be taken into account that a favorite deep fishing hole for bottom fish lies off of Green Point.

What type of paint will be used for the tanks at the tank farm and what amounts of solvent and other toxic materials will be released to the air from this source?

The source and end disposal for water used to fill and test both the storage tanks and pipeline should be given. What rust inhibitors and other materials will be added, and how much?

Where will surplus materials and debris be taken to offsite, on completion of construction? Will this impose a burden on the County Landfill? In erosion control what criteria will be used to determine whether ditch lining and ditch checks are necessary? In laying the line, describe the process for going through rock and give the relationship of blasting areas to distance to residences.

There should be a pre-commitment for compensation of landowners for damages to property in the course of the "maintenance" of the pipeline so that adequate compensation is available in timely fashion and does not wait on years of litigation, such as the posting of funds in escrow or a bond insuring adequate funds to cover the costs of contamination of any drinking water supply. The funds might be payable on certification of damage by a local health officer and should be sufficient to cover the full extent of damages the pipeline might cause.

In discussing maintenance please include details for brush control: herbicides?(what?) burning? mechanical control? In pipeline construction " trees, brush, crops and boulders" will be removed... where do the boulders go? Will there be burning of brush or crops? If so discuss air quality resulting from this and how it will be mitigated. Discuss control-if any- of air pollution from grading and other pipeline laying procedures. What provisions are being made to handle the pipeline barrier to flow of surface water and subsurface water? What damages can be expected as water backs up behind the pipeline?

The quality of pipe metal used should contain a description of its ability to withstand oxidation in fresh and saltwater environments and its resistance to corrosion from within. What is the expected time before the smallest leak can be expected? When can we expect significant deterioration in the various environments and what is the half-life of such a pipeline in these environments ( presumably the weakest link would determine this). Does cathodic protection work in the vicinity of other installations which are grounded or which carry electricity?

This pipeline will in places be crossing marshy ground. What special provisions are planned to reduce settlement and resulting strain on the pipe walls and what is the design criteria for amount of settlement in the soft spots and permissible pipe deformity between hard and soft spots?

The need to give background data supporting scour depth of streams has been mentioned above. Crossing roads will involvetraffic stoppages and slowdowns, representing another inconvenience to the public. Please give details on traffic interference and add a reasonable dollar valuefor this as part of the public costs in the cost-benefit evaluation of the project.

In pressure testing segments of pipe with water what measurements are made, with what instrumentation, and what criteria are applied? Is any pressure drop over a 24 hr. period acceptible? is this test made before or after pipe is covered with dirt in the trench? If done afterwards how can a leak be found and fixed?

Give sources of test water and disposal of same segment by segment as it is planned to test the pipe.

What uses for the right of way are contemplated that would interfere with restoration of same to their original conditions? ( page 1-47)

Pump Station and Delivery Facilities Construction: Describe the standards for hydrostatic testing of pipes and relate this to amount of oil leakage that would be tolerated under these standards. What is the operating reliability of the electronic controls ( historic data)? What is the historic operating reliability of human performance at control stations and tank farms? What proportion of spills have been due to the human factor?

Port: page 1-48: What disposal is made of an in-bound, filled tanker 24 hrs. away which is having mechanical problems affecting control of the ship? What disposal is made of a vessel entering the harbor with a fire on board? What is done with a ship at moorage with a fire on board? ( minor and major fires to be considered). What will be the distance under various atmospheric conditions that the booster pumps and ships pumps will be audible? How many hours per month will the pumps be running for 900,000 bpd and 1.283 million bpd?

There is no discussion of a requirement that tankers used at this port have seggregated ballast tanks. It then becomes necessary to ask where and how the ballast water is discharged and the ultimate fate and implications of oil in the water.

Page 1-49: Please give source data to justify the statement that "The system as proposed would be redundant and estimated to have a reliability of 99.9 per cent". What does this mean in terms of failure rate and in losses of oil which could go undetected or in inappropriate responses to signals to control valves? What is the response time of personnel to emergency situations at each of the unattended facilities?

Page 1-50: How are underwater installations inspected when the pipe is buried? Can corrosion of the pipe wall be detected short of seeing oil leaking out?

Ultimate Abandonment:
Please discuss whether any financial arrangements such as a bond are contemplated to assure that costs of proper final disposal can be met without public burden. It seems that if there is " insufficient crude oil or other economic difficulties" the pipeline might well go bankrupt and unable to take care of final disposal property.

Since "water would be flushed through the system until it was substantially free of oil and residue" it raises questions such as how much water is required? From what sources? Where would it be disposed of, and how much oil would be released to the environment as oil or as oil dissolved in the water? This should be described for each segment of the pipeline system.

Project Cost Estimate:

Please include costs for the 1.283 million bpd project. Please also include for all three project sizes, costs for escalation, interest during construction, cost of line fill ( 13, 174,000 bbl.), working capital and debt expenses. Since this is a new line these costs are relevant in comparing costs of this alternative with other alternatives which are connecting smaller lengths of pipe to other existing already-filled, already financed pipelines.

For operating costs give projected costs for power at the time of start up and five years later . Power costs are rapidly escalating and the DEIS does not seem to allow for this; the base used in all these calculations should be given in a technical addendum. Ten percent contingency seems very low: what is the cost over run historically for other recently constructed pipelines of like size? ( Alyeska's over run? Why should this one be different?) Where is the provision for dismantling at end of project? For compensation in event spills damage water sheds or fisheries? For clean up operations in event of spills? For insurance and performance bonds?. The numerous stream and river and highway crossings will involve extra expense; how do these figures reflect that? Should the project be delayed by strikes or lawsuits will the cost figures for contingencies be sufficient? Give specifics as dollars per day for delay a) before, b) during construction and recent historic record of delays for large construction projects. What special items are likely to cause delay for want of the proper construction material at the right place when needed ( clamps, screws, bolts, etc etc.)

In calculating sales tax local and county sales taxes should be included in addition to the state sales taxes.

In the Technical Addendum please include the basic data and the calculations used in the Dept. of Energy cost analysis which is used as a basis for your figures. The Dept. of Energy Study was updated and expanded between May, 1978 to Sept. or Oct. 1978 and we would like to know the point at which the figures presented were drawn. It is hard to believe that list prices for pipe in 1978 are "conservatively high" considering that purchase of pipe couldn't possibly begin for at least a year from that date. Please justify this, giving figures for price of pipe and labor in construction year by year for the last four years.

Where is there provision in cost estimates for costs of mitigating measures which might be very expensive such as re-location of the Port Angeles hospital, compensatory fish hatcheries, requirement for double hulled tankers with all seggregated ballast, need to offset air pollution in Port Angeles, double walled pipe under all streams, rivers and other underwater locations, restriction of tanker size from Cape Flatterty east and tug escort, use of less than 0.5% sulfur oil for all vessels in Port Angeles Harbor, pick up all fire and explosion hazard insurance premiums in excess of current rates as caused by the project, bonds to cover oil pollution both marine and water table should there be a spill, etc.

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The issue of continued oil supply on the west coast and demand for oil of high sulfur content in the northern and central U.S. are pertinent to the cost estimates since a 33 year operating life at full rated capacity is used in making tariff estimates. The EIS should contain in its technical addendum an indication of firm contracts for purchase of the oil. It should also give the corporate structure and indicate the financial capability of the NTPC. Will there be marketplace competition for supplies such as pipe or will one of the consortium members be supplying the pipe on a non-competitive basis? What about other aspects of the port and pipeline construction: how will the consortium members and their interests affect the costs of the project and how will those interests affect the ultimate scope of the project?

Table 1.4-27 should be reconstructed when more realistic costs are developed.

Net energy balance: Again, please present the basis and documentation for the conclusions reached. The net energy balance should also include the energy losses due to need for mitigating measures to offset pollution and energy losses due to reduction in food chain organisms from shrimp in Port Angeles harbor (a sure loss) to plankton at sea where ballast water will probably be discharged. Include barging of fuel to tankers, which might be a long-haul proposition if it is brought up from California rather than from the inner Puget Sound refineries.

The cost of contingency plans and measures should be included under costs and reflected in projected tariffs. This cannot realistically be postponed to the construction phase of the project because these costs in addition to all the other costs may help to determine the economic viability of the project. The statement that environmentally sensitive areas will be identified after the start of construction, (when the EIS is complete and all permits have been issued) makes a mockery of the whole EIS process (See pp 1-54 & 1-55): "Identification and preparation of topographic maps showing contingency areas, drainage patterns, environmentally sensitive areas and facility locations." (pg. 1-55).
Similarly, "Development of a reliable pipeline leak detection system", Development of an effective fire protection system for each operation location", "Determination of final locations for the pipeline system, stations and delivery facilities" and the other items mentioned on pp 1-54 and 1-55 should all be known PRIOR to the issuance of the EIS.

This entire EIS is premature; the application has never been completed and is still undergoing major changes. This is not fair either to the governmental reviewers or to the reviewing public.

Mitigating measure effectiveness should be stated in more definite terms, e.g. item 7, p 1-57; 1% sulfur oil to be used by tankers in port. Will this be mixed in fuel tanks with high sulfur content oil or will there be a special fuel tank on each tanker for the oil to be burned in Port? What will the sulfur emissions be in each of these cases? How about the fuel burned by ancillary vessels in the harbor?

What will the effect of the 1% sulfur fuel oil have for the 1.283 million bpd throughput on air pollution in Port Angeles harbor and in Olympic National Park as compared with the figures used in the tables in this draft? (didn't the tables assume this when they were drawn up?). What would the values have been if this assumption were based on the usual bunker fuel oil?

Why is it deemed more important to avoid the Yellowstone River in Montana than the Dungeness River, the big and little Quilcene rivers, the Duckabush, the Dosewallips, Nisqually and Hama Hama in Washington? These Washington rivers all lead immediately to estuaries with wildlife refuges or food production or both. Was the Decision on the Yellowstone environmental or political?

Page 1-53, item 27: It appears that cargo tanks may be purged 10 to 20 miles from Port Angeles harbor. This will be in the Straits, in an area where oil can be carried to Canada, and where currents carrying materials in a net-eastward direction can deposit the tarballs back towards Port Angeles. Please describe the areas to be contaminated in more exact and quantitative terms. For ballasting to the extent of 30% in Port Angeles harbor, how much oil fumes will be released to the harbor as a result? Why is it not a requirement that tankers have segregated ballast tanks?

1.5: Inter-Relationships with other Projects, Plans and Policies:

Page 1-60 and 1-61: Clallam County has added specific language to its Comprehensive Plan banning major oil facilities, refineries and petrochemical plants anyplace in the county. This language will also appear in its revised edition of its Comprehensive Plan. Table 1.5-1 should include Clallam Co.

Page 1-61: Transmountain Pipeline Co. is back in the picture as of now (3/5/79) and must be given more consideration.

Where in this EIS is any study reference to substantiate need for the project as (hopefully) comparable to the Canadian National Energy Board Study?

We note with particular emphasis that the proponent does not commit himself to supply of Washington refineries. See p. 1-62 and 1-63:" IN ORDER FOR THE REFINERIES IN THE PUGET SOUND AREA TO UTILIZE THE SYSTEM, SOME OTHER PARTY OR PARTIES WOULD HAVE TO CONSTRUCT AN 80 MILE LONG PIPELINE...NTPC DOES NOT PROPOSE TO CONSTRUCT THE MODIFICATIONS AT THIS TIME OR CONSTRUCT THE CONNECTING PIPELINE OR TO OPERATE THE PIPELINE..."

Description of the Environment

Climate: The climate at Green Point differs considerably from Port Angeles and should be separately described. Rainfall is less as Sequim is approached; SEquim annual rainfall is about 17 inches as compared to 24.6 at Port Angeles. Wind pattern will also differ. Background air quality at Green Point is far better than at Port Angeles and the increment for significant deterioration will accordingly be a good bit smaller. Where is the background monitoring year round for this area? The greater amount of sunlight at Green Point will no doubt affect conversion of hydrocarbons to oxidants. In the absence of full air quality baseline data for both Port Angeles and Green Point worst-case assumptions must be made to protect the public interest. Mixing heights for Seattle would not be applicable for choosing mixing heights. A particular concern is distribution of air pollutants over Olympic National Park, Port Angeles and Sequim, such as hydrocarbons, nitrogen oxides, sulfur oxides as photochemical oxidants and particulates. Oxidant transport to the Seattle area which is a non-attainment area, would be expected within the 36 hour transit time set by EPA for evaluation of this type of pollutant. Since benzene is present in crude oil, is a known carcinogen and very volatile, therefore important to human health, the amount capable of release to the atmosphere and its concentrations and trajectories should be included. Baseline data should state the leukemia and cancer rate for Clallam County and a closer survey should be made in Sequim and in Port ANgeles for incidence of these disorders so that effects of the project may be properly assessed.

CONT

Page 2-4: Include Seattle as a non-attainment area (see above). It is generally recognized that sulfur oxides contribute to "acid rain" at great distances and the extent of fallout from this should be stated and mapped.

It is incorrect that Port Angeles exceeds air quality standards only for particulates. The sulfur oxide standards have been exceeded on the few occasions they were measured. (See page 2-5). It is a gross distortion to imply that this condition occurs only immediately next to the source. The air is blue with choking fumes from the ITT plant particularly, over several miles.

Ozone has been studied in the Olympic National Park area. The reference should be traced and included.

Please give the meteorological and air quality monitoring data from Environmental Res. and Technology Inc. in the Technical Addendum for the final EIS.

Noise levels especially from harbor construction and operation of pumps at the port are of particular concern because first of the proximity to Olympic Memorial Hospital and secondly due to the clustering of residences around the harbor. The nearby hills tend to contain sound. What is the guideline for permissible noise level at the hospital boundary? How will the proposal conform to this? The hospital will be about 8000 ft. from the tanker berthing area.

The length of time over which sound was measured should be stated in the tables so that one can [illegible] of sounds (see table 2.1.1.3-2 and 2.1.1.3-4). Why was a 10 db correction factor added to the night time sound level? If this were not done what would the measurement values have been for 24 hour averages? What will noise levels be with the project in full operation for comparison with these same tables?

Geology: This section is not adequate. See the Dames and Moore studies of Clallam County for a nuclear power plant. See the Geology maps in the State Dept. of Geology under DNR in Olympia. Dr. Rogers' study of the area would be pertinent (U. of Washington PhD Thesis). There is not time for us to do the research to cite all the errors and omissions in this section, but they are numerous: faults along the Hood Canal are believed to be active, probable fault along the Strait of Juan de Fuca, probable faults along the valleys in Port Angeles pointing at the berthing facility, evidence of severe faulting at the end of Miller peninsula, question of migration of the Olympic Peninsula away from inner Puget Sound area, known geologically active fault on Dow Mt. near the south end of Hood Canal, known earthquake epicenter under Blyn Mt. very close to the pipeline route. The evidence of geologic instability was the reason given for the abandonment of the nuclear power plant in eastern Clallam County.

The bluffs along the shore at Green Point are rapidly eroding and serve to feed Dungeness Spit. The entire shoreline from Port ANgeles to the base of Dungeness Spit was placed in a Conservancy environment and removed from intense residential development despite wonderful view property for the reason of this instability.

What two surface rupture faults are you referring to in Washington state on page 2-52?

Please give the full report of Shannon and Wilson for the soil cores done at the tank farm and harbor sites. What was their report regarding liquefaction under seismic conditions? Regarding weight bearing capability?

Soils: give the penetrance of soils on the Dungeness Spit and Green Point to water and to oil. What is the depth of the aquifers cited? The housing development immediately west of the tank farm site has been plagued with landslides which have probably been aggravated by discharge of septic wastes into the subsoil. What further discharge of water from parking lots, roads, septic field or other sources will travel towards this development? Will compression of subsoil water bearing layers by the weight of the tanks alter water courses so as to aggravate further the landslide problems of this subdivision? With what degree of confidence based on what known facts, can assurances be given and what fiscal responsibility is contemplated if these assurances prove to be misplaced?

Water in Port Angeles harbor no longer receives sewage effluent; please correct p. 2-20. The mills have gone to great expense to remove wastes from the water. The EIS should reflect current water quality. Since this clean up we now have a shrimp fishery back in the harbor as well as good salmon fishing. Damages to these resources should be included in the costs of the project and the public should be provided with restitution such as replacement of the damaged resource.

Visual Resources:

Add consideration of view of the Olympics from distant points as Seattle and Canada and how this would be affected by suspended hydrocarbons and other pollutants in the air. Include view of the sky, currently blue most of the time, and the grey color of hydrocarbon containing smoggy skies, the brown color of nitrogen oxides floating above. Include the esthetic value of looking down from Olympic National Park on a smoggy Port Angeles and Sequim-Dungeness valley. Include olfactory effects in the sensory impacts of the project. Include loss of sunlight energy falling on the earth and the generally reduced visual and sensory effects of this.

Page 2-36. Electric Energy: the Final EIS should include the '78-79 winter peak which exceeded forecasts. Residents fear that in a power crunch the local industry would be curtailed as a result of pipeline need for electricity. Residents also expect domestic power rates to soar as a result of need to construct expensive new generating facilities. This is a public cost and should be mitigated by asking NTPC to pay for its power on an incremental cost basis, i.e. cost of generation of new power.

Recreation: Please include the shrimp sports fishery inside Port Angeles harbor. A favorite deep fishing hole for Haddock is off Green Point. With the Hood Canal bridge now underwater visitation to the Olympic National Park may decrease, but the pressure for overnight stays will likely increase as tourists find it impractical to make a day trip to the Park.

Population: Figure 2.1.1.15-1 should be up-dated if possible because retirement influx has increased very considerably and this is pertinent to allowing increased air pollution; the compromised cardio-respiratory status of the aging population means human health effects at lower levels than anticipated by the EPA's recently more relaxed standards. The proportion of over age 50 yr. population in Port Angeles and in Sequim, less than 10 miles of and downwind from the tank farm should be ascertained and recorded.

Does table 2.1.1.15-6 include retirement income and Social Security benefits?

Later data on wage and salary employment are available and should be used.

CONT

Fire Protection: It is proposed that NTPC have one fire boat in the harbor. It takes 5 hrs. steaming time for boats in the Puget Sound area to arrive if help is needed. The local Port Angeles Fire Dept. has 4 pumper trucks, one pump ladder truck, and is rated five on a scale of 10 for capability. How many professional personnel are available? What size fire could be handled with the above equipment?

Medical services: It should be noted that the hospital sits almost at the entrance to the harbor about 8000 ft. from the tanker berth and is therefore vulnerable to both fire and explosion. If it is incapacitated the next nearest hospital is at Port Townsend 46 miles away over narrow winding roads. The community has very limited capacity to transport injured people. The number of ambulances should be given. A mitigating measure to be considered in light of expected explosion in the harbor every 4.6 yr. would be to relocate the hospital in a safer place or to make it explosion and fireproof with added noise barriers and air pollution equipment to protect it from these adverse effects as well.

Police service in the Clallam County community is in serious shape with inadequate jail facilities and severe personnel problems in the Sheriff's department.

Amenities: Sequim, Port Angeles and Forks have cable TV. Most of the rest of the county does not. The youth program is inadequate with private sources trying hard to meet teen ager needs. Drug abuse and alcoholism are both problems and crime rate is rising.

Page 2-48: Dispersion Potential: EIS should include that the influence of terrain and low mixing heights from the marine climate will accentuate the air pollution especially for Port Angeles and to a somewhat lesser degree for Green Point. The mountains rise relatively close to the sea at Port Angeles and when winds come from the north pollution is trapped much as it is in Los Angeles.

Page 2-48: Include Port Angeles in the $SO_2$ air quality violation areas (see p. 2-5). On very limited sampling, less than once a week, sulfur oxide maximum for 24 hour average has been found to reach 551 (State standard being 260 and Federal standard 365 for this finding. The one hour maximum has been found at a maximum of 2,593 with the comparable state standard being 1048 not over once per year.

Note that the high ozone readings in the Seattle/Tacoma areas can be influenced by hydrocarbons released at Port Angeles and Green Point with sunlight here in the "sun belt" acting on the material prior to its arrival in the metropolitan areas.

Page 2-53: Liquefaction: Where in Washington are the areas identified where the pipeline could be affected by this and what measures will be taken to offset this? Were the marshy areas along Hood Canal included? The unstable soils at Green Point?

Landslides: Where in Washington are landslide areas capable of causing pipeline rupture? What is the frequency and magnitude of slides in these areas? What measures are proposed to offset this?

Outburst flooding: Obviously the Dungeness River is capable of this kind of action with intense scouring in the course of flooding. What other rivers have potential for ripping out or damaging the pipeline either from water scour and pressure or from heavy debris dragging into the stream bottom? Give the frequency of major flood events for the larger rivers.

Revegetation is obviously going to be difficult in some areas. What is going to be done to insure satisfactory long term reduction of erosion? Will it require that top soil, fertilizer and water be provided to any areas denuded more than a specified length of time? How will this be enforced? This would be especially important for areas bordering streams.

Characteristics of major river crossings 2.1.2.6-2: Please give references to source material. Where can we see the description of how these values were obtained and assess the adequacy of the underlying studies? The source quoted is only NTPC. In considering water quality it should be noted which rivers, like the Dungeness, support salmon hatcheries and salmon and steelhead fisheries, and which feed estuaries, and which serve as public drinking water supplies.

Biological components, p. 2-88: Marine areas that might be affected by the pipeline don't start at Hood Canal! The Straits would be affected by in transit oil vessels and by spills at the tank farm and its associated pipelines directly or via Siebert Creek; contamination of the Port would also affect these waters. A break in a line at the Dungeness River crossing or near it would foul up the estuary in Dungeness Bay. A spill in Port Angeles harbor would also reach the Dungeness Spit and Bay. (See Coast Guard Study of a simulated small spill at Port Angeles Harbor). See also page 3-20 fig 3.1.7-2 where a tanker casualty off Neah Bay in Sept. would coat South Vancouver Is. and page 3-24 where a tanker casualty off Port Angeles in Sept. sends oil all over Dungeness Spit reaching to southern Lopez Island (fig. 3.1.7-6. If the tanker off Port Angeles had a casualty in March Dungeness Spit again gets coated front and back and the spill reaches Whidby Is., Lopez Is. and Burrows Bay. Chronic oil spills at the terminal in Port Angeles " could taint subtidal clams and decrease shrimp, crab and fish sports harvests. Some diving waterfowl mortality. Water quality in harbor would be degraded."(Map addendum, page 68).

The Port Angeles harbor submarine pipeline construction short term would degrade water quality with suspended solids, less dissolved oxygen, uptake of heavy metals and chlorinated hydrocarbons by intertidal and subtidal clams; consumption of contaminated shellfish could affect human health. (Item 2 page 68 of Map Addendum). Rupture of Port Angeles pipeline to shore would have critical effects on shellfish, waterfowl would experience mass mortality in Port Angeles, offshore Green Point and Dungeness Spit. Consumption of marine resources by humans could give a health hazard. Why are these materials buried in the Addendum? Why are not impacts on Protection Island included? This is an outstanding habitat for seals and birds such as the rhinocerous auklet, tufted puffin and seagulls.

Under Biological components either reference should be made to p. 3-26 to 3-28 or these materials should be given here, namely that in the "operational phase" dealing with oil spills and an area from Neah Bay to the Canadian shores to Lopez Is. and North Central Whidby Is. affected species are mollusca, killer whales on migratory route, sports fisheries, harbor seal, river otter, clams, crabs, oysters, shrimp and large communities of waterfowl (not to mention fish!).

Why is the use of the tank farm site and southern Puget Sound Basin by Bald Eagles " put down" ? The EIS states that "No threatened or endangered species of marine mammals or birds are found within the Puget Sound Basin". The eagles are then characterized as visitors. Another word might well be "feeding" which is vital to survival. At any rate these birds are known to nest on the Olympic Peninsula and are believed from their behaviour to have a nest at or near the tank farm site.

CONT

The use of Dungeness Spit by large numbers of shore birds and waterfow. should be given in this section in quantitative terms.

P. 2-80: The Olympic Peninsula is noted for diversity of plant and animal life. The golden chinquapin is well known on the Olympic Peninsula and probably occurs along the pipeline route.

Rare and endangered plant species on the Olympic Peninsula would also include the following: Arctostaphylos x media, Calypso bulbosa, Eriophyllum linatum var. achillaeoides, Erythronium oregonum, Hemitomes congestum, Lipidium virginicum var. menzieaii, Scirpus cyperinus, Sedum lanceolatum var. rupiculum, Botrychium virginianum, Chrysolepsis chrysophylla, Eburophyton austiniae, Plantago macrocarpa, Bromus vulgaris var. eximius, and three Clarkia amoenas (var. pacifica, var. caurina and var. quadrivulnera), Puccinellia pauciflora var. pauciflora, Shepherdia canadensis, Abronia umbellata var. acutalata (found on Ediz Hook), Bromus sitchensis var. sitchensis, and Juncus gerardii.

The designation of Olympic National Park by UNESCO as a Biologic Reserve Area is a result of its rich species diversity. As such a reserve the area would serve as a repository for genetic material to reconstitute damaged and depleted parts of the world. It should be totally unacceptible to allow air pollution and particularly oxidant type air pollution which can damage genetic materials, to degrade air quality in this park.

Asto bird life. Peregrine falcons have been sighted at Dungeness Bay. There are roosting trees for them near Jamestown Beach. Birds of concern from the Audubon "blue list" (birds which are threatened) and which are present on the Olympic Peninsula are: The Redneck grebe, the Western Grebe (both highly susceptible to oil damage since they sleep on the water), the Canvas Back, Sharp shin Hawk, Cooper's Hawk, Marsh Hawk, Osprey (a summer resident with a couple of nest sites known on the northern part of the Olympic Peninsula), the American Kestrel, the Pigeon Hawk, the Common Tern which migrate through Dungeness Bay, the Short Eared Owl, the Hairy Woodpecker, the very rare Western Bluebird, the Yellow Warbler, and the Warbling vireo.

2.1.2.13 : Transportation and Utility Networks: What provision will be made for summer traffic along Hood Canal during construction? This is of recently increased urgency since the sinking of the Hood Canal Floating Bridge. The area is closed at times for hours by landslides and those landslides may well be increased when NTPC tries to place pipe trenches just above the slide-sensitive hill! What effect will construction have on slope stability both here and elsewhere along the pipeline?

2.1.2.15 Social and Economic Conditions: It is misleading to simply list Clallam County as having two hospitals since one is over 60 miles away, to the west, in Forks (See table 2.1.2.15-1)

2.2 Future Environment, page 2-154 Air Quality: since we are in fact a SO2 non-attainment area (See page 2-5, also the EPA publication Washington Environmental Quality Profile 1978 Fig. 1, Air Quality Status Map-By County), it will have to be anticipated that air quality will be brought into line with provisions of the Clean Air Act. The EPA has already been petitioned to take formal action in this regard. Further, a gasoline shortage (real or contrived) with rising gasolene prices may be expected to hasten the use of methanol and propane as fuels with improved air quality as a result. There will also be a financial disincentive favoring less automotive use.
2.2.1.6, Aquatic Resources: It is straining severely to argue that surface and ground water will be degraded by residential development at Green Point, because of severe restrictions on use of this unstable land which will prevent that kind of development. Our Shoreline Master Plan designates the area along the bluff as "Conservancy". The same comment applies to 2.2.1.8 "Terrestial Vegetation" and 2.2.1.9 "Terrestial Wildlife" and to 2/2.1.11 "Visual Resources".

Environmental Impacts Sec. 3

The harm done by not having a completed application is reflected in your statement: " When quantification was not possible due to a lack of specific information, a range of values was assigned..." "Detailed construction and operation plans have not been completed (page 3-1) And, with regard to mitigating measures "...it cannot be determined with certainty how or where some of the measures would be applied." The NTPC plans are still undergoing major revision and we must protest the premature issuance of the EIS.

Summary: 3.1.2 : Does not include the maximum size of the project in which WAshington State refineries are served, throughput 1.283 million bpd, therefore a false optimistic picture is given of all types of impacts. This would result in disclosure in the summary, which many readers never get beyond so it MUST be in the summary, that at full development the Prevention of Significant Deterioration Increments will be exceeded at the Port on 32 days a year and Class I standards in Olympic National Park would likely be exceeded 6 to 7 days per year. Even this assessment is based on methodology which understates the case and fails to take into account the fact that Port Angeles is de facto a non-attainment area for sulfur oxide. Particulate releases from the project for the non-attainment area in Port Angeles are not given for the full development phase at all, despite 511 tanker trips a year with attendant tugs and fuel barges in addition. Please give a full account with references (in a technical addendum, if necessary). The fully developed phase speaks to a third tanker unloading berth which implys displacement of more of our established industry than the smaller proposal, or the vital Coast Guard Station. A third submarine pipeline from port to Green Point would disturb an additional 40 acres of sea bottom, 7 additional (air polluting!) storage tanks at Green Point and additional power consumption which is in short supply. We would have to expect 511 tanker visits a year, an in-transit tanker spill every 2.3 years, an at berth tanker spill every 0.35 years, a barge spill every 0.91 years, explosion and fire casualties on coastal areas every 49 years and in the harbor every 9.18 years. The barge spills were apparently based on barges coming from refineries in inner Puget Sound. Should they come up from California what would the casualty risk be for these barges? We would have to expect on-shore spills from the storage site every 0.34 years with 13.6 million barrels being stored at Green Point. The storage area could expect a fire of over $1000.00 damages once in 21 years. Three additional pumping stations would be added requiring 284.3 million KWH annual electricity. A pipeline spill between Green Point and Burlington would be anticipated every 1.7 years.

Emissions from construction 3.1.2.-1 : Should be given for the full project. Noise levels and hours should be given with reference to proximity of the hospital and residences. Although the state exempts construction noise from most of its standards, these standards should be cited to give evaluators comparability levels. The duration of emissions and maximum concentrations should be given for the project's air pollutants at the project boundary and

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at Olympic Memorial Hospital, and at the nearest residence to the tank farm site. For particulates a 24 average would be adequate, but for oxidants, sulfur oxides and nitrogen oxides five minute and one hour maximums should be stated and for hydrocarbons a one hour, and a three hour average should be included. There are hydrocarbon sensitive persons and a one hour concentration would be able to affect their brain function. If air pollution values are to be excessive at one or more residences a mitigating measure might be re-location during the period of high emissions. With the fire and explosion hazard relocation of the hospital would be one mitigating measure or alternatively provision of fire and explosion proofing of the building. The hospital might also require air conditioning to control air pollution to hospital-safe standards.

Operation Phase: Add calculation for full size of project. Comments for construction phase above also apply here. Please give full description of mathematical models used in a technical addendum. It must be noted that weather data at the Coast Guard Station is only applicable to the Port Angeles area and not to Green Point. What factors were monitored? Please include a table giving mixing heights for both the port and Green Point. Measurements of mixing levels have been done by ITT Rayonier with aircraft on 7/6/72, 6/2/72, 6/4/72; these values should be included. EPA's "Washington Environmental Quality Profile 1978 shows Clallam Co. in Fig. 1 as a county not meeting ambient air quality standards, and in Fig. 2 and 3 shows Clallam County exceeding the health standard for $SO_2$. In discussion this report notes that the rain shaddow effect of the Olympic Mountains causes a sinking effect of the air on the lee side of the mountains which "also affects the ability of the atmosphere to disperse pollutants. The subsiding air results in the stabilization of an air mass, thus inhibiting the mixing process which normally helps to dilute pollutants." ( pp 35, 36)

Please include all available data for background levels on $SO_2$, sulfates, total suspended solids, particulates, hydrocarbons, benzene, nitrogen oxides, and photochemical oxidants with respect to when and where measured, accuracy of the method to measure, and note capability of detection of 5 min. peaks, 1 hr. and 24 hr. maxima, and frequency of sampling. Then tell us how these would be affected by the operation of the project at the hospital at Port Angeles, at residences in Port Angeles, At Green Point and at Sequim. We believe there is grossly insufficient air quality data, that at least one full year of background collection of data is necessary ( which could have been done because proponent has been considering this site for longer than that). The theoretical calculations made leave much to be desired. The assumptions made should be given in this report as well as the worksheets. For background were actual emissions used or "permissible emissions" unrelated to the real world? Show the applicability of the model to this area. The EPA report referred to above, page 47 states: "The earlier discussion suggested that air mass stability at west coast locations like Port Angeles is likely to be more stable than the Pasquill system would indicate due to marine and subsidence inversion or influences."

In Table 3.1.2-4 please give the comparable statistics for 1.283 million bpd throughput and the time ( as hours per year or 20% of the time if that is the figure) various emission rates would be exceeded. What are the legalities and law enforcement measures lying behind "assurances" that fuel used by the tankers would be 1% sulfur type? Physically how is this accomplished? Will the higher grade fuel be added to other fuel in the tanker's fuel tanks or will a separate fuel tank be used?

Please document from independent sources ( Not NTPC!) data such as existing sources of air pollutants in Port Angeles ( Table 3.1.2-6)

Please extend Table 3.1.2-7 to include the 1.283 million bpd throughput. Please also include measurement of existing air pollution 1.7 miles E SE of the proposed port facility where impact is calculated to be highest.

Please detail the ambient air . values ( dates, method and place of measurement) used in comparing the combined effects of background with the proposed project at Port Angeles ( see page 3-4, next to last ¶). Was the instrumentation used for ambient air up to Federal (EPA) standards for accuracy or was it a bubbler lacking a necessary temperature control?

What would be the scenario for the worst case: three 300,000 DWT tankers unloading simultaneously under adverse weather conditions for the 36 hour unloading time? Over a 20 year plus lifetime of project this should not be dismissed as occurring infrequently; people breathe even on the less common bad days and cannot suspend this function even once in five years. It is the draft EIS which is unrealistic when it refuses to give worst case emission rate combined with worst case meteorology ( p. 3-5). It is second rate bureaucratic thinking to consider impacts only as " determining compliance with standards" rather than compliance with human health needs which those standards were promulgated to protect.

Please give primary source as used by SAI 1978 for Table 3.1.2-8. Please add data on mixing heights and define "inversion strength". The ITT plant has exceeded state standards and has been fined...it is not always "well within state standards" ( p 3-5) See your DEIS pages 2-4 and 2-5.

Table 3.1.2-6 is inconsistent with Table 2.1.1.2-3. Note that three specific sources of particulates for industrial sources in the Port Angeles area total 1,881 tons/yr according to State Dept. of Ecology but according to Northern Tier PC ALL existing sources of particulates total only 1568 tons.

What is the evidence that air stagnations and inversions in the Port Angeles area last no longer than the 6 hour time usey in the Valley model? Between June 3 and June 7, 1978we had a prolonged inversion and air pollution values for sulfur dioxide exceeding 0.40 ppm on 11 hours scattered from 11 A.M. on June 3 to 9 A.M. on June 7, 3rd and Chestnut station, Olympic Air Pollution Authority measurement, listed as Method 13. Please repeat your modelling studies using more conservative assumptions.

Please discuss acid rain in terms of quantities and distances of final deposits as it would be affected by the project. This appears to be entirely missing from the report.

The type of particulates to be released by the project will be petrochemical carbon particles rather than road dirt. Carbon particles adsorb sulfur and nitrogen oxides as well as other substances and concentrate these substances from the air. When breathed the particles adhere to respiratory linings thereby greatly magnifying health effects over effects from pure gaseous pollutants studied in a laboratory situation. The DEIS should discuss the impacts of the mix of pollutants on human health for background pollutants and for the changed mix resulting from the project. Modelling should include the distribution of the mix as well an individual pollutants.

/The nitrogen oxides emissions for the 1.283 million bpd project should be compared to existing emissions. Documentation is needed for the source of existing emissions. Since nitrogen oxides and nitric acid can have health effects over a short period of time the maximum one hour and maximum 5 min. peaks should be given for ambient air and for project emissions.

CONT

Ozone formation due to hydrocarbon emissions is a major consideration for Port Angeles, for Green Point, for Sequim and for Seattle ( 36 hour travel time is part of the definition of area affected by hydrocarbons according to EPA regulations). Please calculate the pertinent figures for the 1.283 million bpd throughput. What levels of hydrocarbons will be encountered in the harbor, at the hospital, at the tank farm, at Sequim? How much benzene will be released to the atmosphere from the project in Clallam County and what levels may be expected in the above locations? There are persons hypersensitive to hydrocarbons who live in this area, having come here as a refuge from city air pollution. It is not true that hydrocarbons are without health effects. ( Read the warning on any can of petroleum distillates if you have any question). Please give ozone background levels especially in Olympic National Park but also in Port Angeles. Show the pattern of plumes from the 36 hour travel of the hydrocarbons.

Are the hydrocarbon emissions based on ly 21 % of tankers without seggregated ballast? How is tanker traffic to be limited to insure this proportion will not be exceeded? Why is it not a mitigating measure to require that all tankers using the port have seggregated ballast? Will tankers use exhaust from their stacks to blanket oil being unloaded and reduce explosion hazard?

Please include modelling of disperson for hydrocarbons and for ozone.

Please give technical data and cite references to substantiate a 40% reduction in estimated hydrocarbon losses from the floating roof tanks at Green Point. In the basic underlying studies in how many instnaces did the tank emissions exceed predicted values?

Please substantiate the validity of using a Reid vapor pressure of 4.0 psia and the temperatures of 97 F summer and 80 F in winter. What wind factors were used in calculating rate of vaporization? What are the Reid vapor pressures for each of the predominant types of oil to be put through? What is the chemical composition by classes of hydrocarbon for each of the predominant types of oil? Include benzene, aldehydes, sulfides, sulphonated hydrocarbons, ethers.

Page 3-7: emissions of ozone levels based on two 190,000 DWT tankers discharging simultaneously is not adequate for . disclosure of the probably actual emissions for a 3 tanker berth situation with 300,000 DWT tankers, thus does not provide a look at the full scope of the project early enough in the decision making process to meet the demands of NEPA. Further it should be disclosed what wind speed, mixing height, sunlight factor and temperature assumptions underlie the values obtained by modelling to obtain a value of 0.055 ppm in late afternoon at Ediz Hook and at Green Point.

It is hard to believe the report that emissions would be gaseous and invisible.

Elsewhere in the document aerosol formation is discussed: certainly every put off visable hydrocarbon emissionsin the form of terpenes; it makes a blue haze. Please in the final EIS give a more true to life account of the visibility effects of the hydrocarbons to be emitted at the point of emission and after sunlight and associated air pollutants act on them. Please present the basis for your statement that reduction of visibility from the project would be " substantially smaller" ( p. 3-7) from the proposed project than existing sources. Please give the combined effect of both. Discuss this in terms of a viewer in Seattle, and in Victoria as well as the view from Olympic National Park.

Noise: See comments made above. Impacts section here should include responses to the questions raised on noise also. What redress will be made to occupants of residences near Green Point for noise disturbance in excess of Washington State noise standards during nighttime construction activities? This will last 8 to 12 months. Do any of the impacted residents have health problems such as heart disease, nervous or mental illness or high blood pressure which might be aggravated by the noise? Whats measures are planned to monitor this so suitable compensation for health effects can be made if warranted? What basic monitoring for these same health parameters will be made at either Green Point area or for residents impacted near the harbor area? For hospitalized persons?

Topography and Geology 3.1.4

The summary neglects to mention the possibility that the project eiself may cause erosion of Dungeness Hook due to interference with littoral drift as the three submarine pipelines ascend the bank to the storage facility. The change in the harvor bottom by placement of the pipeline from Ediz Hook to shore may prove highly significant in light of the practice of ships to drop and drag anchor at the entrance of the harbor as a braking mechanism. The injection of water into the soil at the tank farm for waste disposal may lubricate the nearby bluff area and contribute to landsliding. What studies have been made of this process? Some further information is needed to determine whether this will aggravate the landsliding already endangering the residential development to the west of the tank farm site. The entire presentation on soil stability is seriously deficient as is description of known earthquake epicenters and faults in the area.

As to the harbor construction having negligible effects, there is no discussion of changes in circulation of water within the harbor by the docks, ships, booms, etc. which might well affect the deposition of geologic materials. Will the pipeline across the harbor act as a sill to retain sediments at the harbor bottom?

How and to what extent will the permeability, porosity, cementation and moisture content of the soils at Green Point be changed by the project? As is characteristic of this document the references cited are insufficient and not available to the reviewer.

Indiscussing slope failure on the west side of Ediz Hook caused by pile driving and laying pipe on the east side it should be noted that the Hook has been eroding with threatened loss of the harbor and is being shored up by rip rap on the western side. Where was the breach in relation to the project site? Please give cross section to scale of the Hook at the project site with and without the project in place. What is the risk of adding to the earlier breach?

At abandonment why would submarine pipes be allowed to be left to rust with oil contaminated water in them? Why shouldn't they be pulled out?

Soils 3.1.5

What "fluid leaks" are expected in addition to oil leaks? Diesel? Chlorinated hydrocarbons?

Aquatic Resources 3.1.6

Describe the geographic extent of the regional aquifer underlying Green Point site and its relationship to the drinking water supply of off site residences. What is the potential for contamination of the aquifer?

CONT

The Dungeness River water is already over-committed for its low-flow periods. How will the project adapt to this situation? There is a salmon and steelhead fishery on this river and while 10% of low flow might seem small offhand, when water is being removed for irrigation and for the town of Sequim that 10% is badly need for the fisheries to survive. It is a critical point, that non-existent extra ten per cent.

What and how much corronion inhibitors and bactericides will be added to pipeline and/or tank farm test water? Provide details to back up your statement that a 1:5 dilution factor is all that is required before discharge.

What will high pumping rates for well water at the tank farm site do to neighboring wells? What redress is planned if salt water intrusion affects them or if they must drill deeper for water? Why at this late date isn't it known whether Agnew Fairview Water District can supply the project and what the implications are for extension of the water district service to new residents moving in to the area since this would be an economic side effect of the project displacing retirement growth as well as other local industries.

Describe the aquatic resources of Siebert Creek--its fishery and probable effects of discharges from the project on this. What restitution is to be made for the loss of this public resource?

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NO OILPORT INC.

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PRESENTATION TO BUREAU OF LAND MANAGEMENT FOR DRAFT
ENVIRONMENTAL IMPACT STATEMENT FOR
NORTHERN TIER PIPELINE PROJECT
MARCH 15, 1979

I am Norma Turner, President of No Oilport, Inc, a citizen non-profit organization formed to protect the current industries of the North Olympic Peninsula.

Before addressing specific concerns on the draft EIS before us today I would like to clarify, for the record, what will be done with the oral comments made today. A hearing by BLM in Port Angeles a year ago, March 8, 1978, had two problems. First not everyone registered to speak was called upon and secondly the hearing was taped but no hearing record was made. The audience was assured the "pertinent" comments would be noted from the recording by [illegible]. After a thorough review of the current EIS is it apparent that very few, if any of those concerns made their way into the EIS. Concerns such as secondary development continue to be ignored. We are all wasting our time if the comments today again will only be [illegible] or ignored. My specific question then is how will the comments, questions and concerns raised today be recorded? Will there be a transcript? If not how will they be recorded and by whom? Without answers to these questions and assurances an accurate record will be made of the hearing today the public input will be meaningless and pointless.

My first comment actually address the EIS is a practical matter of the actual physical dimensions of the document. I, and many others, found the 11 x 16 size to be cumbersome and impractical. The standard 8½ x 11 is by far a preferable size.

The existence of No Oilport, Inc. is mentioned once in chapter two and in the following paragraph another Clallam County group, OPERA received a full paragraph discussion on their reasons for endorsing Northern Tier. It is interesting that the attention given to each group by BLM is directly disporportionate to the size and activity of the groups. One line for N.O. with a membership of approx 500 and a full paragraph for a OPERA with a membership of approx. 40. It is also interesting to note while BLM deemed it relevant to mention 1000 signatures supporting the project we were not even asked for signature. If BLM had asked we would have been most happy to present a letter from the Clallam County Commissioners dated June 1, 1977 acknowledging receipt of over 4000 signatures opposing an oil port in Clallam County. For the current record I am holding close to [illegible],000 signatures registering opposition to an oil port on the North Olympic Peninsula. This one small example of accentuating the positive, in terms of what is best for the proponent, and minimizing the negative is repeated time and again throughout the document in air quality, secondary impacts, etc.

A second example is found on page 3-55. "Small chronic spills would occur frequently with little noticeable impact". Two comments on this statement. What is "small" in specific quantities and how often is "frequently."? Secondly in the preliminary draft the statement on chronic spills noted it would decrease recreational fishing in the harbor. The latter comment, deleted from the current EIS, clearly is not supportive of the project, but the current statment certainly is. Why was the change between the preliminary draft and the present draft EIS? Who made the change? What supporting documentation was used?

The entire issue of how much was changed between the preliminary draft and the present draft needs to be addressed. With the above example it is apparent changes were made, yet when the coordinating committee made up of several federal agencies met in Portland just two weeks after the preliminary draft was issued they were informed their comments were appreciated, but "time constraints" would not allow them to be incorporated into the draft EIS. We have a letter from BLM verifying this statement. Who then had opportunity to make changes between the preliminary draft and the January 3 draft? Exactly what changes were made and why? What documentation was used to insert or remove comments?

There are many examples of subjective statements in this EIS, but I too have time constraints which allows one minute per 72 pages of the document so I will only cite one example.

Page 3-55 "Opponents of the project would be highly sensitive towards any noticeable changes to these resources (air quality and water quality) brought

CONT

about by the oil port. Impacts would be magnified for them." Such a statement leaves the impression air and water quality changes are subjective changes that are magnified or minimized by each person. Under the Clean Air Act, EPA regulations and state standards and routine monitoring by industry and government make air and water quality changes a quantifiable impact. If in doubt ask ITT Rayonier and Crown Zellerbach about their expenditures of millions of dollars to clean up the harbor. The state forced that action to meet certain standards---and it didn't matter whether the community chose to magnify nor minimize the water quality.

Further examples will be given in our written comments, but at this time I will move on to the alternatives section.

Section 1502.14 of the mandatory guidelines on the preparation of environmental impact statements issued by the President's Council on Environmental Quality considers the alternatives as "the heart of the EIS." These guidelines issued last November reflect the most up to date opinion on the EIS process.

If truly the alternatives section is the "heart" of the EIS then if I were a carfiologist I would have give the entire "body" a very poor prognosis due to the overwhelming weakness of the heart.

The purpose of the ES, as stated on page 8-1 is "To provide a means of transporting Alaskan and foreign crude oil from the west coast to the Northern Tier states and other inland areas where refineries are faced with a declining supply from Canadian sources." From this definition two criteria aredeveloped for indentifying alternatives. One: Provide a dependable supply of crude oil to Northern Tier states. ( What happened to the inalnd states mentioned in the abovedefinition?) Two: Relieve the excess supply of Alaskan crude oil on the west coast. Why is there no attempt to quantify the "declining supply"?

The analysis moves on and first unit trains are not to be addressed "because they would not be able to move 933,000 barrels per day." Suddenly we find an alternative is just by an unannounced criteria--specific volume despite the fact there was no definition of volumes needed to supply the area in the above purpose.

/"Other possible energy sources such as coal, solar or synthetic crude are not addressed....they would not meet theobjectives of the proposal." This is contrary to the stements made by Sen. Henry Jackson, known spkesman on national energy issues for the U.S. Congress, at the Northwest Regional Energy Conference June, 1978. While discussing implement a "coherent supply strategy" Sen Jackson stated:

> The essential elemtns of this strategy are at least four in number. First, we must develop with a sense of urgency the new energy sources like solar that will help replace fossil fuels in the 1990's and beyond. (emphasis added)

Yet you are trying to address a supply problem into the year 2000 and yet ignoring one method of alleviating the energy shortfall.

Page 8-2 "Increased domestic production or the reallocation of the existing crude oil supplies also do not meet the purpose of the proposal."

In light of your own stated criteria to provide a dependable supply to the Northern Tier states it is incredible to see a dismissal of the most dependable supply to that area--access to it's own production. Frequent and optimistic article have appeared regularly in the oil industry journals on new finds and reopening of old wells in the Northern Tier area of the Overthrust Belt and Williston Basin. The 160 million barrel reserves added to the U.S. oil reserves in 1978 were from primarily from five states--two of the five were in the Northern Tier area, Wyoming and North Dakota.

Exchanges with Canada or Japan were also discarded amaizingly enough on the theory "they do not serve to relieve the west coast surplus." I say amaizingly because this reasoning is contrary to literally dozens of statements made in the past by government, oil industry and environmental groups that swaps would alleviate the west coast surplus.

All of these arbitrary and caprioce dismissals of alternatives because they do not offer a complete solution to the problem defieslegal precendents and is contrary to data supplied to your by the Deparatnet of Energy. The courts have already ruled that "federal agencies cannot disregard alternatives simply because they do not offer a complete solution to the problem."

The either - or approach, either one alternative solves all the problems OR it won't be considered is in direct conflict with recomendations submitted to BLM by the Department of Energy April 28, 1978---six months before even the preliminary draft was issued. That Draft Interim Report on Northern Route Demand, Supply and Transportation Alternatives stated:

> Although most discussion of alternatives for supplying the Northern Tier and Upper Mid-West States tend to focus on each alternative individually, it is clear that there is a degree of interdependence involving some of the projects that requires that the array of possible alternatives be looked at in groupings that can respond to supplying the areas in question. When the situation is seen from this perspective, the supply problem appears in a more flexible context: it is not then a question of facing a decision process involving and either or choice of (1) selecting one pipeline or (2) seeing refineries go out of business; but rather the decision becomes one of selecting which mix of options (both structural and non-structural) would be capable of meeting the needs of the affected areas. (emphasis added)

Page 8-5 "Only those viable alternatives capable of utilizing the west coast crude oil surplus to meet the demand in the Northern Tier states were given final consideration." Again the uniwllingness to closely define needs in terms of volume and type of curde oil leads to a faulty judgement. This

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statment infers the west coast crude oil surplus if moved into the Northern Tier States can all be used there, this approach ignores the reality of refinery configuration.

Summation of alternatives pg 8-5 is tricking. The ONLY alternative deemed to "critical environmental impacts could result from marine oil spills and air quality deterioration....and from new transmission lines across undistrubed desert country." was the Logn Beach, California SOHIO project! Having visited the Long Beach Harbor and observing the current oil industry activity there is difficult to imagine that moving 500,000 b/d through the harbor would result in CRITICAL impact from marine oil spills and yet moving 1.2 million barrels a day through the Port Angeles, totally unaccustomed to oil industry activity would be less than that. It is even more of a question when in your own EIS on that same Long Beach proposal evaluated Port Angeles as an alternative and concluded " adverse impacts from stack emissions upon aesthetics and recreational recources would be greater than at Long Beach." (emphasis added) Also "The adverse impact from sulfur diocide with and without mitigating measures would be the same or worse." It goes on to say "Port Angeles presents a similar population desity to that of Long Beach downwind from the porposed terminal." Considering that analysis was done as an alternative analysis for SOHIO, a throughput of only 500,000 b/d it stands to reason now faced with 1.2 million b/d the impacts are even greater. As a nurse I know a critical patient is one who's condition if it deteriorates will probably die. Thus we must assume if the impacts on Long Beach for air and water quality are critical then Port Angeles , by your own admissions in the SOHIO EIS will has a very poor prognosis.

The preliminary draft EIS essentially admitted to that conclusion noting that abondment of the project "would improve air quality and thus might permit industrial expansion." Why is this statment yet another negative finding that was not printed in the current draft?

As chapter moves into specific alternative locations in Washington it is a real challenge to make logic out of the OIW oil spill risk analysis. Intransit spills are projected to be higher for CherryPoint than Port Angeles because of the longer intransit time involved for the tankers. Yet when pipelines are compared amazingly enough a 117 mile pipeline from Cherry Point, that will carry 350,000 fewer barrels, is projected to spill more than 200 miles of pipeline along the unstable slopes of Hood Canal. Suddenly distance traveled does not seem to be a prime consideration. Additonal even though undected leaks on the pipeline are calculated as a percentage of volume according to the OIW risk analysis study volume in pipeline transportation was not considered a criteria for projecting spills. Table 8.4.1.6-3 then attempts to rank ports by estimated pipeline spill frequency and does not even use a baseline distance for comparison. Rather we are asked to compare ports on siplls per different numbers of years and differing numbers of pipeline miles. How I ask then can a reader of the document without extensive mathtical knowledge make any rhyme or reason out such a ranking?

None of this surprises me coming form the OIW. What does surprise me is that the BLM awarded a contract to OIW in Arpil , 1978 one month after Senator Paul Connor testified before you in Port Angeles that:

> The orginal Oceanographic Commission of Washington study dealing with the siting of an oil port had a staff recommendation based on detailed professional data in opposition to Port Angeles as such a site. The Commission in a purely political decision overturned that professional report.

To accentuate the political involvement of OCW and its non-profit corporation, the OIW, in the oil port issue they submitted a draft resolution January 18, 1977 which included in Section 7

> Immediately initiate a study or studies leading to the selection of not more than two potential sites, located in the Strait of Juan de Fuca, at or west of Port Angeles, for a single, common-use oil transfer facility and related storage and pipelines...the siting sutdy shall being immediately.

With this strong public and political record on the desire to establish an oil port in this vicinity it is little wonder that tankers, pipelines and onshore facilities are all safer here by OIW standards than in Puget Sound. It also explains why fires and explosions in Port Angeles are projected to cause minimal problems. The BLM contract to OIW certainly leaves a large area of the EIS to a strong challenge.

In conclusion I would like to briefly mention concerns again about alternatives. Discussion of the Midcontinent system is yet another example of conflicting statements. Page 8-6 "Presently, no spare capacity for crude oil distribution has been projected through 1980." Later in the same chapter is a list of expansion proposals in the midcontinent system schedules for completion in 1978.

The Chicap Pipeline is expanding capacity by 108,000 b/d; Explorer Pipeline by 55,000 b/d; Williams Bros. expansion of 40,000 b/d and Seaway Pipeline is currently operating 80,000 b/d under capacity.

Page 8-114 "Pending these further proposals, this hypothetical new capacity cannot be further analyzed." Not even proposal in the permitting process were analyzed. Northern Line, which has received a certificate of need from Minnesota and is well along in the permitting process is not even discussed. Looping of capline by your admission is being considered, and with the completion of LOOP will be needed there arestrong reasons to analyze the movements of the crude offloaded there. If Capline is expanded and moves the over 2 million barrels per day into the midwest how will this impact the projected throughput of the Northern Tier porposal. According to a recent press release from NTPC they hope to "penetrate" the market in the midwest, thus by their own admission the projected high volume is more than the current shortfall.

In conclusion then I will submit the bulk of our concerns in written form and conclude with a statment from the Minnesota Agency as they reviewed the NTPC project. In discussing the fact that NTPC has non oil sponsorship "it creates the possiblity that some of the participants may be interested in selling steel, or providing consulting or construction services as well as completing a crude oil pipeline........this diversity of interest means the project must be very carefully examined to determine whether it will stand on its own as an energy facility after the other benefits to its sponsors have been secured."

This issue must be discussed what are the costs and benefits to the public, the nation versus benefits to only the proponents. The EIS process thus far has absolutely failed to answer that question.

Thank you.

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oral + written testimony
Loretta M Pettenato
Stony Creek Ranch
Huson, Montana
59846
626-5552

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I am a life time citizen and resident of Montana. I am a land owner in the nine-mile valley very much against the Northern Tier Pipe-line proposal. I seek answers and information that Northern Tier has failed and refused to relinquish.

I understand that the eminent domain law is the law which Northern Tier is acting on for jurisdiction. I also understand that according to this law necessity must first be established. I do not feel that this has been established as of now. When a Northern Tier representative was asked "what would be the result if no Alaskan crude oil was delivered to midwest U.S. refineries. the answer he gave was "I'm sorry we are not qualified to answer that question." Who is, I ask. When a nine-mile resident asked a Northern Tier rep why their proposed route ended up in nine mile, their responce was "because the Indians denied us right of way." I question the justification of that answer. No where in the meeting held between landowners + Northern Tier was there any mention of this route being the best route, socially or environmentally. There was only mention of this route as being

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financially better for Northern Tier. Northern Tier fail to realize that it will be the consumer in the end that will pay for the pipe line. So it should be the consumers who decide where it should go. Is it truly realistic to follow verdant mountains directly across, where damages would be devastating when there are other alternatives with existing pipe-lines and corridors where environmental and social damage would be considerably less? Why haven't the highways, or Burlington Northern lands, or Federal property been considered as an alternative?

In the environmental impact statement there was no mention of the some 21 streams that flowed from the 9-mile divide down to 6-mile road. Why not? Could it be because the BLM Impact Statement was written on the impacts of Northern Tier's first proposed route? Will a complete impact statement be made on the impacts this pipe-line would have on nine mile? If not, why not? Could it be that with Sen Melcher's new amendment demanding that the new BLM statement process ~~must~~ be "speed up" that a complete statement will not be done? I pray this will not happen.

In the current BLM Impact Statement there was little mention of soil loss, no specifics were given. The impacts along Siegal Creek + Siegal pass were vague. "(15-35 acres/mile)" The impact Statement states that the pipeline will cross active faults, but no mention of the possible damages. Forest and Riparian habitat loss were also stated, no facts were given as to how drastic of a loss. There was no mention of property devaluation, a large concern among landowners. Northern Tier openly admitted that their route is being considered as a power corridor. Now while in the impact statement was there mention of the "total" impacts of a full-fledged energy corridor. I accuse the BLM impact statement of being too vague, badly researched, and appears to be nowhere near legally sound. My question is this. How can a factual impact statement be made if the persons making the study have never seen nine-mile (a mile wide at the most), six mile, and all the places the pipe-line proposes to go through? Why have the BLM failed to make a water study, or ground study of these areas?

The nine mile valley is fragile concerning the water table. Is this impact Statement based on guesses? Is someone up in his office just going to "guess" that this pipe-line won't ruin my water? I cannot accept this.

I was told that the Northern Tier route would cross 1500 miles of land. Of that 1500 miles only 400 miles would be Federal land, the remaining 1100 miles would cross private

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landowners' property. I am amazed that N.T. can say this is for the people and have the figures given above. In my opinion they are stomping on the class of people Montana needs most. Farmers, ranchers, the last of the "Out of Outdoors generation." There has been no contracts or lease agreements presented to these landowners. Why not? According to the state these will be drawn up after the permits have been given. We as landowners want some kind of demonstration contract before the permits are given. We want to know what we are dealing with. Its only fair. Also according to the state these contracts will be drawn up between N.T. and the landowner. Who is to assure us these contracts will be honored? Why haven't the legal rights of landowners been made available to the people? Why haven't bonds or lease agreements been presented or acknowledged? No information has been given to the landowner on how complaints against the company would be handled. No promises that if a pipe leaked the land owner could rest assured that the co would clean up the water + soil damages. How can N.T., even with the Eminent Domain law refuse to compensate the rights of the people? How can Sen Melcher (a man on many peoples bad list) pass an amendment that landowners can only file suit on a Federal Level? We are not wealthy, we cannot afford their lawyers when we lose. It appears to me that landowners needs are unimportant, Northern Tier's needs are the only important factors.

Will there only be one qualified inspector per 150 miles? N.T. expressed that this may be the case. Is this inspector a member of N.T.? It is not physically possible that this one man can cover all that ground properly. Will he just "miss" my land? The result is obvious. Improper check valves, badly welded pipes, few, if any x-rays taken of the pipe welds. How can we as landowners force N.T. to hire proper inspectors other than from their own company and be assured that the pipe crossing our property will be put in safely, accurately and the proper tools and devices will be used in crossing through our land and water source? We have to be assured, its all we have.

As it stands now N.T. has no intention in doing what is best for the people, wildlife, or environment. The results of this attitude "Just get it through" will be devastating. It takes concerned level headed citizens and their representatives to see to it that the proper measures are taken (Do we really need this pipeline?) It would cost N.T. more money but we are dealing with a much more important resource than

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just out. We are dealing with life sustaining properties. Agriculture, clean water & air, wildlife and peoples lives. All the things that make Montana an important place, a survival place, now days a unique place. How can our government allow such a one-sided, badly organized co. to rape this beautiful

country with little or no consideration of the land and its inhabitants. How can they allow these money hungry companys to take what does not belong to them. I love this valley I live in. It is peaceful & free. I consider its value & beauty important. I want my children to know of Montana's beauty, its quiet, its smell, its life. I did not struggle to obtain my home in nature to have it stomped on and senselessly ruined. I do not chop my wood for heat & bucket my water from a clear creek for no reason. I sweat over my garden & seek health through my home. I suppose it would be easier to live in town with all its luxurys, buttons, dishwashers, thermostats (energy consuming products) etc. but I chose to struggle, give up material needs as many have done so that I may live in the country, grow my food, sneak up on a doe in the morning hours, because I love & respect these things. (as they should be) I am against N.T. not because it goes through my land, but how it plans to go through my land and hundreds

of miles of other peoples land. I would be against this proposal whether it touched my property or not. I believe it to be wrong. It will not benefit Montanas people. It is not for the people, but for the company, Melcher, Westinghouse, U.S. Steel, etc. It is researched badly, has little to no quality, and it promises room for other energy routes, other companies.

I am upset, so angry that the Constitution gave me the right to own my land, & N.T. can take that right away. Pipeline + Powerlines. I don't think these companys could offer Montana a worse deal.

Sincerely,

Jnette M. Pettinato

RECEIVED
APR 4 1979

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March 31, 1979

Bureau of Land Management
Room 1250 Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Subject: Northern Tier Pipeline Company's Across Puget Sound Alternative Proposal

Gentlemen:

The inability of the people of Island County to obtain the Environmental Impact Statement for the above project is frustrating and infuriating. I have only a part of the statement and must make my comments based on that fragment.

It is obvious that the Puget Sound route was never seriously considered an "alternate" one. The change from the original proposal was deliberately manipulated to prevent adequate study by any public agency or by the people directly affected. Your intransigency in refusing information or adequate time while accepting a new pipeline route is indefensible.

There is not one mitigating or favorable aspect in this proposal insofar as the State of Washington or the County of Island are concerned. Whatever the need for oil transshipment to the Midwest, it is unthinkable that one state must be despoiled to provide benefits for others or for corporate profit.

Please make this letter and the attached comments a part of the Environmental Impact Statement for the Northern Tier proposal.

Sincerely yours,

Jimmie Jean Cook
Jimmie Jean Cook
Island County Liaison Officer
State Historic Preservation Office

cc: President Jimmy Carter
Senator Warren Magnuson
Senator Henry Jackson
Interior Secretary Cecil Andrus
U.S. Congressman Al Swift
State Senator Pat Wanamaker
State Representative Joan Houchen
State Representative Sim Wilson
Jeanne [illegible] Welch, State Hist. Pres.
Island County Commissioners
Island County Planning Office

2.1.2.1 CROSS PUGET SOUND

Environmental Analysis
"The following material is in part adapted from the Northern Tier Pipeline Company application for certification made to the Washington Energy Facility Site Evaluation Council (EFSEC) in 1978."

Comment — Is there a part of this that was not submitted to the EFSEC?
Is there something that has been omitted from this EIS?

Climate and Air Quality
Reference to Sections 3.2.1 and 3.2.2.

Comment — These sections are not available. This is inadequate information.

Noise
Reference to Section 3.2.3.

Comment — This section is not available. This is inadequate information.

① Topography/Geology
"Except for small scattered deposits of peat or muck the route across Whidbey Island would cross glacial deposits of drift, till and outwash."

Comment — This is not an adequate description of the topography of Whidbey Island.

"There is no subbottom information available for Saratoga Passage which the route would cross from Whidbey to Camano Island. The passage is probably underlain with glacial materials."

Comment — This is inadequate information.

"Construction of this alternate route segment would result in relatively minor topographic impacts, consisting primarily of landscape changes and temporary drainage alterations. These impacts would be most pronounced near the Strait of Juan de Fuca, where the pipeline would descend a 40 foot bluff at Port Williams and ascend a 100-foot bluff near Point Partridge,...."

Comment — The bluffs on the west side of Whidbey Island (Point Partridge) are eroding cliffs, sometimes referred to as feeder bluffs for other beach areas. Tampering with a 100-foot bluff on island terrain is not a minor impact.

② Geology and Geologic Hazards

"As the route would traverse predominately unconsolidated alluvial, glacial and marine sediments, impacts to the geology would be minor consisting largely of the production of waste material unsuitable for fill (see also section 3.2.4)."

Comment — Section 3.2.4. is unavailable. Where are they going to dump this waste? Island County already has a landfill problem with the waste material currently being produced.

"This route alternate would cross an area of moderate to high seismic activity which has been designated in the 1976 Uniform Building Code as a Seismic Risk Zone 3 (maximum earthquake damage expected) ...Numerous low level and several moderate level earthquakes including one of intensity VIII, have occurred in the area but none have been related to known active surface faults...."

Comment — An earthquake recording 3.4 on the Richter Scale was experienced earlier this month. The center was 60 feet below the surface of Coupeville, county seat of Island County and a few miles south of the proposed pipeline.

"Potential slope instability problems exist along the proposed route, particularly near Port Williams, Point Partridge, and the moderately steep terrain east of Duvall, but no landslides (submarine or terrestrial) have been identified."

Comment — As previously noted, the bluff at Point Partridge is an eroding bluff and material continually falls to the beach below. Visual evidence may be seen by visiting the beach and noting the observation towers that originally were built on the bluff at Fort Ebey and which now lie on the beach. The Washington Department of Natural Resources has a sign at the Point Partridge recreational area that directs attention to the gravel continually falling from the bluff.

③ Soils
"The route across Whidbey Island traverses soils that are mostly well drained, are gravelly and sandy, and occur on slopes of up to 15 percent gradient."

CONT

③ Comment — The land developers in the area west of Oak Harbor have been trying to re-activate a drainage district because of drainage problems there. This is inadequate information.

"On Camano Island the route traverses poorly drained loam soils occurring on nearly level to gentle slopes."

Comment — Camano Island has severe sewage problems in this area.

④ Aquatic Resources — Physical Components
"Ground water on Whidbey Island is primarily contained in glacial drift deposits and depth to water is from 17 to 150 feet."

Comment — Both Whidbey Island and Camano Island depend upon ground water supply. Oil spreads through soil and when it reaches the water table, it causes permanent pollution. This is a risk that we cannot tolerate.

⑤ Biological Components

Comment — The entire section relates damage to the fish population that would be disastrous to commercial and sports fishermen. The effect upon the food chain and other forms of marine life is not addressed. The referenced Section 3.2.6, Biological Components, is not available.

⑥ Marine Resources
"Oceanographic conditions between Whidbey Island and Camano Island in Skagit Bay and Saratoga Passage differ from those of the Strait because of restricted tidal flow into the basin....Marine waters in the Strait of Juan de Fuca are classified extraordinary (Class AA) whereas, marine waters in Skagit Bay and Saratoga Passage are considered excellent (Class A) (Washington State Department of Ecology 1977). The reasons for the difference in water classification are the restricted tidal current flow, slow flushing, and industrial, domestic, and agricultural effluents in the Skagit Bay and Saratoga Passage."
"The alternate underwater pipeline route would pass under ship traffic lanes and a navigational precautionary area, where inbound and outbound ships turn. A ship in distress, because of loss of engines or steerage, would probably drop anchors. Should this occur in the inbound or outbound ship traffic lanes or in the precautionary area, there is the possibility of a pipeline rupture caused by anchor dragging."
"A leak detection system, capable of sensing a 0.5 percent loss of throughput volume, would allow a leak below the sensing limit to go undetected. Pipeline leaks of up to 3,540 barrels per day for 709,000 barrels per day throughput and up to 4,660 barrels per day for 933,000 barrels per day throughput could continue undetected until visually noticed."
"No information is available on oil-spill trajectories for underwater pipeline ruptures on the Whidbey Island-Camano Island leg of the submarine pipeline."

Comment — This is serious and completely unacceptable. A spill in Saratoga Passage would devastate both Whidbey and Camano beaches. No study has been made and no information is available.

⑦ Biological Components
"No information is available on trajectories of oil spills for the Whidbey Island-Camano Island leg of the submarine pipeline. However, it is possible that a significant impact to shrimp and crab species, sports and commercial salmon fisheries, and nonsalmon fisheries would occur. Major waterfowl areas, associated with saltmarshes in Skagit Bay and in Saratoga Passage, could experience high bird mortality and/or low egg hatchability. The saltmarshes and accompanying mud flat habitats could retain oil for several years after a spill in the slowly flushed basin."

Comment — This entire section is a checklist of disaster, yet Northern Tier has chosen this route without even knowing the consequences of accidents or spills in Saratoga Passage. This is unacceptable.

⑧ Terrestrial Vegetation

Comment — There is inadequate information. Section 3.2.8 is not available.

⑨ Terrestrial Wildlife

Comment — This is inadequate information. Section 2.1.1.9 is not available. When habitat is destroyed, the inhabitants are destroyed. They cannot displace others in established territories.

⑩ Cultural Resources
Island
Central Whidbey Island Historic District
Fort [illegible] Blockhouse site
Prehistoric sites
[illegible] mill
Camano Island Pioneer Cemetery

Comment — The sites listed in Island County would be adversely affected by this pipeline proposal. The Central Whidbey district, the second largest in the United States, is listed on the National Register of Historic Places and contains ninety buildings or monuments. Eighteen buildings are also listed on the Historic American Building Survey of 1936. The impact statement does not even address the Ebey's Landing National Historic Reserve which was created by Congress last year and which includes the same area. There is much to be said about the value of these identified resources but the total pipeline proposal is so overwhelmingly destructive it is sufficient to state that the cultural resources are inadequately considered. Section 3.2.10 is not available.

⑪ Visual Resources

Comment — Sections 2.1.1.11 and 3.1.11 are not available. What is meant by low visual impact? What structures in addition to the pipeline itself would be built? A ninety foot easement void of trees and vegetation traversing the very limited land area of Whidbey and Camano Islands is a major visual intrusion. A pipe running up a 100 foot bluff is visible to everyone, not merely boaters on the Strait. Nothing is said about a pumping station. Does oil flow uphill?

⑫ Land Use
"The corridor in Island County would pass through or adjacent to several residential and builtup areas as well as forested and agricultural land."
"Each of these counties (Island included) has zoning controls, and has adopted land use plans and Shoreline Master Programs. It is uncertain if the proposed facilities would be in compliance with all of the applicable zoning controls and use plans, but generally a provision is made for utility corridors, which includes pipelines."

Comment — No provision was made in the Island County Comprehensive Plan or in the Island County Shoreline Plan for a ninety-foot easement cutting a swath across Whidbey and Camano Islands. There is inadequate information and faulty reasoning.

⑬ Transportation and Utilities Networks

Comment — Section 3.2.13 is unavailable. This is inadequate information.

⑭ Recreation Resources
"Loss of wildlife viewing opportunities and tourism would occur in oil-fouled areas during the period of containment, cleanup, and an additional unknown amount of time needed for the reestablishment of pre-spill conditions."
"Public access tidelands areas, marinas, parks, and pleasure boating would be affected for the period of spill containment and cleanup. Loss of the natural values which are a significant attraction to the Puget Sound area would affect an unknown number of tourists and recreationists."

Comment — Island County encourages tourism which is a substantial part of its economy. The Deception Pass State Park (on the north end of Whidbey Island and lying adjacent to Saratoga Passage) is the most popular park in the

CONT

⑭ State and attracts over a million visitors each year. That is a starting point for determining the unknown number of tourists who might be affected. The beaches are a viable part of recreation in Washington State for both residents and visitors. The presence of a pipeline with its very real possibility of a spill is an unnecessary threat to the islands and the waters of Washington.

⑮ Social and Economic Conditions
Population - "Oak Harbor (Island County) during summer months could be adversely impacted because of possible housing shortages. The operational phase would result in a population increase substantially less than 1 percent."

Comment — There is already a housing shortage in Oak Harbor. Rental and purchase costs for housing is seriously inflated. Additional stress on our county and urban facilities will produce higher costs and greater hardship for residents.

⑯ Employment - There is inadequate information. Presumably there would be little employment for local residents.

⑰ Housing - "On the mainland part of the alternate route only Oak Harbor would experience a large enough influx of nonlocal residents to be adversely affected during the time of construction."

Comment — The City of Oak Harbor is on Whidbey Island, not the mainland. The housing shortage already noted.

⑱ Fire Protection
"This alternate route would pass through a number of fire districts and municipal service districts, except for two segments totaling 7 miles in unprotected areas."

Comment -- Island County Fire Protection District No. 2, which is located on the north end of Whidbey Island, does not presently have enough water resources or equipment to protect the rural areas. There are very few water systems or hydrants in existence.

⑲ Police Protection
"Oak Harbor, on the mainland part of the alternate route would experience nearly 5 percent population increase. It has a police department with 23 full time and 12 reserve officers or 1.98 officers per thousand residents. This is more than the national average of 1.6 for towns of 10,000 to 25,000 population. (Northern Tier Pipeline Company 1978)."

Comment -- Again, Oak Harbor is on an island, not on the mainland. It is a Navy town with its own police problems. The pipeline appears to pass through rural areas only (no adequate map [illegible] part of the alternate proposal) and not through the city limits of Oak Harbor. This means that the Sheriff of Island County would also be providing police protection to the citizens who may suffer as the result of an influx of pipeline workers. There has been no time to find out how many percentage points per officer are available in the County. The expense for additional officers, if they are needed, would be borne by the taxpayers of Island County.

⑳ Medical Care
"The availability of medical care is adequate except on Whidbey Island where it is marginal."

Comment -- Whidbey General Hospital is a public institution supported by the taxpayers of Whidbey Island. Additional facilities would be paid by the taxpayers.

㉑ Economics
Taxes - "Sales taxes amounting to about $9.2 million would be applicable to construction of this alternate as compared with $8.8 million applicable to the proposed route. Property taxes would also be higher. Tax estimates for individual counties are being prepared."

Comment — The bulk of sales tax goes into the state revenue and would be of little value to Island County which will be severely impacted. Many retired persons live in and around Oak Harbor who can ill-afford higher property taxes. The Island County Assessor has already publicly challenged the estimates made by Northern Tier regarding additional tax revenue for the county.

㉒ Construction Costs - "Construction costs would be about $9.3 million greater than those for the proposed route in the initial phase. Since this route would require one less pump station, the additional construction costs for the ultimate phase are presumed to be slightly less (0-1/2 million) than those for the proposed route."

Comment -- The construction costs will ultimately be paid by the consumer, not the corporations involved. No reference was made to pumping stations in the visual impact statement. This is inadequate information.

㉓ Operation Costs - "Operating costs would be lower than those for the proposed route. Cost estimates will be prepared."

Comment -- Economics is the determining factor for any project. For Island County the cost will be increased services, depletion of resources and an increased tax burden. The loss of tourist revenue will be great. The loss of fish and wildlife with their dependent industries cannot be estimated. The contamination of our water supply could be an expensive problem beyond our financial ability. There is not one benefit, economic or otherwise, for the State of Washington or the County of Island, in this entire proposal.

Alternate plans for transporting oil to the Midwest have been discussed. It is time to consider less costly and less devastating projects.

JJ Cook
Jimmie Jean Cook
P.O. Box 85
Coupeville, Washington 98239

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ISLAND COUNTY PLANNING DEPARTMENT
P.O.BOX 488 COUPEVILLE WASHINGTON 98239
PHONE 678-5111
321-5111
629-4522

March 30, 1979

Mr. Chuck Hoyte
Bureau of Land Management
Room 1250, Lloyds Building
700 N.E. Multnomah
Portland, Oregon 98232

Re: Northern Tier Pipeline,
Draft E.I.S.

Dear Mr. Hoyte:

As a follow-up to our conversation on Monday, March 26, 1979, the Island County Planning Department would like to be placed on the distribution list to receive the above referenced draft E.I.S. as well as all supplemental notifications.

As you are now aware, the Northern Tier Pipeline Company issued the enclosed "Statement of Decision to Amend Application and Proposed Procedure" to the Washington Energy Facility Site Evaluation Council, (EFSEC), noting their decision to reroute the proposal. The stated intent is to redesignate the "primary route: passing under 18 miles of the Straits of Juan de Fuca, across Whidbey Island, over Camano Island, and south toward the original designation across Washington and the northern tier states.

We assume that Island County, Washington, was inadvertently omitted from original distribution of the document. Given the potential direct impacts upon this community and the unique sensitivity of the marine-island environment, we respectfully request that the comment period be extended to allow our review of the draft E.I.S. We are quite concerned about the lack of available information and analysis of the submarine crossing which may warrant supplemental environmental review of this proposal by your agency.

Thank you for your consideration of our request. Please don't hesitate to contact me if you have any questions.

Very truly yours,

Leonard D. Madsen
Assistant Director

LDM:cg

cc: Island County Board of Commissioners
Bill Sels, Energy Facility Site Evaluation Council

Enclosure

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BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

| | |
|---|---|
| In the Matter of the Application of<br>NORTHERN TIER PIPELINE COMPANY,<br>A Montana Corporation | APPLICATION NO. 76-2<br>STATEMENT OF DECISION TO AMEND APPLICATION AND PROPOSED PROCEDURE |

Northern Tier Pipeline Company, the applicant herein, hereby gives notice of its decision to amend its application across (underneath) Puget Sound rather than around the southerly end of Puget Sound. A "cross-Sound route" has been designated in the existing application as an alternative but with modification will now become the proposed action. The new pipeline route will enter the bed of Puget Sound at approximately Port Williams and proceed to the west shore of Whidbey Island at Point Partridge. It will then proceed northerly and then easterly across Whidbey Island, crossing under Saratoga Passage from the Polnell Point area to the north end of Camano Island. After entering the mainland near Stanwood the route will mostly follow existing pipeline and transmission line corridors southerly toward the North Bend area, where it will join the original route. The cross-Sound route will eliminate pipeline contact with Mason, Thurston, and Pierce Counties, and on-land contact with Jefferson County. It will introduce pipeline contact with Island and Snohomish Counties.

Maps of the new alignment will be filed with the Supplemental Application materials scheduled for submission to the Council March 30, 1979. The March 30 materials cannot include the detailed environmental assessment data necessary for inclusion in a Draft Environmental Impact Statement, but it is contemplated that material can be submitted by approximately the end of May. It is contemplated that the March 30 submittal will include sufficient information that the counties affected by the new route can begin preparing for county land use planning and zoning hearings.

Northern Tier does not contemplate other project changes which would have the effect of substantially delaying the application process. While recognizing that this cross-Sound change will necessarily cause some delay, the company wishes to cooperate fully with the Council to minimize that delay and to expedite to the maximum extent possible the processing of the application.

DATED this 26th day of March, 1979.

NORTHERN TIER PIPELINE COMPANY

By Gordon G. Conger
Gordon G. Conger
of Preston, Thorgrimson, Ellis,
Holman & Fletcher, General Counsel

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To Foothills [illegible] Pipeline    [illegible] March 1979

Dear Sirs,

I wish to comment on the proposal by Foothills Pipeline Co. to build a pipeline from Skagway into Canada. I am a resident of Haines and am familiar with the Lynn Canal area. I do not believe that a pipeline from Skagway to Canada with regular tanker traffic in Lynn Canal is in the best interests of myself or the persons of the area. I was born and raised in Fairbanks and was present there during construction of the Trans-Alaskan pipeline and have travelled to all points along it during actual construction. I am familiar with pipeline construction and its environmental and social impacts.

The Foothills proposal has been supported almost entirely by the supposition that it will create jobs for Skagway residents and help the economy. Having lived through Trans Alaska pipeline, I tend to disagree with the positive benefit of more jobs. Jobs during construction are union jobs, done by union people most of whom are associated with the contracting company long before they would be hiring in Skagway. A few jobs would be given to local residents (clerks, maids, laborers, [illegible]) with the majority [illegible] [illegible] increase will lower the resident standard of living and in the end they will be worse off. After construction is over the depression will hit and back into the [illegible].

CONT

Tourists, who are very important to the economy of Skagway will not be impressed by an expensive little dusty town full of pipe line workers. Having their panoramic, scenic view of the White Pass area obscured by clouds of dust, D-8 cats, and falling boulders from the large cuts that would be necessary.

In winter a [illegible] [illegible] provide avalanches or rock slides could easily break the pipeline causing large amounts of oil to spill into the Skagway River. Such a spill would have a devastating effect on the fisheries, the town, and tourism. Far more of a negative effect than can ever be reconciled by a few jobs.

An oil spill in Lynn Canal would have a devastating effect on the fisheries of the area. Fishing is currently the major industry of the area. An oil spill would have a severe effect on fishing and the local economy. No means of oil cleanup or how one would be undertaken exist. No information exists to know the effects of an oil spill on the marine life or the animals dependent on it. Any oil spill could have a permanent effect on the Lynn Canal area and the fisheries.

In conclusion, I believe that the negative effects of a pipeline from Skagway to Canada and the associated tanker traffic greatly outweigh the positive benefits of such a project.

I am not willing to sell-out my way of life, the diversity of wildlife, and scenic quality of the Lynn Canal area for a few jobs.

Sincerely yours,

Wayne Ehlert

Wayne Ehlert
PO Box 65[illegible]
Haines AK

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The University of North Dakota
GRAND FORKS 58202
DEPT OF BIOLOGY

March 30, 1979

Comments
Northern Tier

Mr. Lloyd Shoesmith
c/o Richard Lemmon
State Land Commissioner
State Capitol
Bismarck, North Dakota 58505

Dear Mr. Shoesmith:

① I have examined the Draft Environmental Statement, Crude Oil Transportation System (Northern Tier Pipeline Company) and I note that the route of the proposed pipeline will follow that of the existing Portal Pipeline through eastern Grand Forks County. The Portal Pipeline was laid across the State-owned land in Section 16, Oakville Township (T151N, R25W), Grand Forks County, North Dakota, prior to the acquisition of that land by the University of North Dakota. The University uses section 16 plus the nearby NW 1/4 of Section 9 as a biological field station known as Oakville Prairie. Except for the disturbance caused by the construction of the Portal Pipeline and a firebreak constructed several years ago, all of section 16 is a natural area maintained by the University for use by classes as well as research by faculty and graduate students. This area was recently designated as a potential unit in a proposed network of research natural areas identified by the Nature Conservancy.

The impact statement is inadequate in that it does not indicate either in the text or in the map addendum, a significant impact to a natural ecosystem of great importance and value.

The disturbance caused by the construction of the Portal Pipeline across Section 16 is still evident in the plant communities that developed on the disturbed areas. Additional disturbance now will further decrease the naturalness of the only remaining stand of native upland prairie in the Red River Valley set aside for conservation and education uses. It is the desire of the Biology Department that no additional disturbance be allowed on this land.

② If, for reasons of routing, it is essential that the Northern Tier Pipeline cross Section 16, I request the following considerations.

1. An easement be granted, but the ownership of the land be retained by the State.
2. The easement be limited to the minimum width required to install the new pipeline as close as possible to the Portal Pipeline.
3. The plans for construction across Section 16 be submitted to me for review and approval as regards the separation of soils, access of machinery, re-seeding and dispersal of rocks, etc.
4. The Northern Tier Pipeline Company authorize and finance research by University of North Dakota biologists on the pre-and post construction biota in the easement area so that the existing characteristics can be recorded, improved reclamation techniques developed, and long-term effects of the project monitored.

I suggest that the appropriate officials of the Northern Tier Pipeline Company be advised to contact me at (701) 777-2851 so that we can arrange to discuss this matter and view the field station.

Sincerely yours,

Paul B. Kannowski

Paul B. Kannowski, Ph.D.
Director
Oakville Prairie Field Station

PBK:pe

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United States Department of the Interior
BUREAU OF LAND MANAGEMENT
OREGON STATE OFFICE
P.O. Box 2965 1729 N.E. Oregon Street
Portland, Oregon 97208

IN REPLY REFER TO:
1792 (911.2)

PUBLIC HEARINGS REGISTRATION FORM

For Public Hearings on the Draft Environmental Statement on the Crude Oil Transportation System as proposed by the Northern Tier Pipeline Company

To: Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

(Please print)

From:
Name UNITED FISHERMEN & ALLIED WORKERS UNION
Street Address 138 E. Cordova St.
City and State Vancouver, British Columbia Canada
Zip Code V6A 1K9

I wish to appear at the following public hearing and express my views:

I intend to submit written documentation: Yes x No ____

Signature

Verbal testimony may be limited to 10 minutes; written testimony is acceptable until April 2, 1979

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UNITED FISHERMEN & ALLIED WORKERS UNION

VANCOUVER, CANADA

SUBMISSION

TO

BUREAU OF LAND MANAGEMENT

NORTHERN TIER PROJECT

DEFICIENCIES IN THE DRAFT ENVIRONMENTAL STATEMENT:
CRUDE OIL TRANSPORTATION SYSTEM
PORT ANGELES, WASHINGTON TO CLEARBROOK, MINNESOTA
AS PROPOSED BY NORTHERN TIER PIPELINE COMPANY

APRIL 2, 1979

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PRESIDENT J.H. Nichol SECRETARY-TREASURER Geo. Hewison BUSINESS AGENT

UNITED FISHERMEN AND ALLIED WORKERS' UNION

U F A W U

Telephone 684-3254

Headquarters: The Fishermen's Hall, 138 East Cordova Street
VANCOUVER, B.C. V6A 1K9

INTRODUCTION

The United Fishermen & Allied Workers Union (hereinafter referred to as U.F.A.W.U.) has a membership of about 7,000; whereas these workers earn their livelihood from the entire British Columbia fishery, more than half of them depend upon the fishery that would be impacted detrimentally by tanker traffic and oil spills that would ensue if the Northern Tier Pipeline proposal should be implemented. The interests of U.F.A.W.U. members would be similarly jeopardized by the Trans Mountain Pipeline proposal to expand Cherry Point into a superport. Indeed, we view with great concern the existing tanker traffic from Alaska to Cherry Point and realize that our entire coastline is already at great risk. The U.F.A.W.U. is therefore dedicated to a reduction rather than an increase of coastwise tanker traffic.

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CONT

In view of the vital interest of the U.F.A.W.U. in the welfare of the Pacific Coast fishery, we submit this statement as a supplement to oral testimony made by U.F.A.W.U. President Jack Nichol and researcher A. G. Thomlinson before the U.S. Bureau of Land Management hearing, held in Port Angeles, Washington on March 15,1979.

GENERAL STATEMENT

Owing to our special concern for the commercial fishery, we shall focus our criticism on the marine aspects of the Draft Environmental Statement - Crude Oil Transportation System as proposed by Northern Tier Pipeline Company.

Having reviewed the marine components of the D.E.S., it is our considered opinion that this document falls far short of the degree of rigour and disciplined analysis that is required by either citizens or decision-makers. We submit that before a responsible assessment can be made as to the long term impacts of the Northern Tier proposal, or the Trans Mountain Pipeline Proposal, much new data, and the correction of highly inaccurate statements is essential.

① Furthermore, the U.F.A.W.U. regards the D.E.S. as having no validity whatsoever for the port-pipeline proposals discussed in section 8.4.3. This section of the D.E.S. amounts to little more than a summary of the views of the various proponents. Moreover, we find particularly offensive the suggestion that this D.E.S., and presumably the F.E.S., could be used by the President of the U.S.A. as a basis for approving a port-pipeline proposal that lies wholly or in part within Canadian territory. Such a potential infringement of Canadian sovereignty is all the more repugnant to us in view of the fact that the Canadian government, as the result of the West Coast Oil Ports Inquiry, has rejected the Kitimat Pipeline porposal. We therefore view inclusion of the Kitimat Pipeline proposal in the D.E.S. as a potential means of pressuring the Canadian government to reverse the decision to reject the Kitimat Pipeline proposal. We therefore urge that the F.E.S. confine itself to the Northern Tier Pipeline proposal.

DEFICIENCIES IN THE D.E.S.

② 1. IMPACTS OF TANKER TRAFFIC AND ACCIDENTS

We note that Table 1.4-2, p. 1 - 7, of the document indicates that the Northern Tier Pipeline proposal would result in about one tanker per day additional to existing tanker traffic passing through the Juan de Fuca Strait and that more than 25% of this new traffic would consist of large vessels (up to 327,000 DWT) carrying foreign crude. In the absence of any statement in D.E.S. to the contrary, we must conclude that much, if not all, of this foreign crude would be carried by "flag of convenience", vessels, of such registry as Liberian, Panamanian etc.

Regrettably the D.E.S. fails to address the very serious problems of safety and responsibility that characterize foreign tankers. In view of the notorious reputation of such vessels and the ineffectiveness of existing international law (Wang and Mawhinney, 1978, p. 21 - 34) we submit that the D.E.S. should have included a thorough risk analysis including as a minimum, the following considerations:

TANKERS:

For both domestic and foreign tankers, a survey of hull design, age, maintenance history, seaworthiness, accident record, marine law, violation record, competence of master and crew, navigation equipment, oil spill containment and recovery capability.

WEATHER AND CLIMATE:

A thorough summary of factors which affect marine navigation, in particular wind and visibility conditions for the entire Alaskan, B.C. and Washington coastal waters through which tankers would travel.

TANKER TRAFFIC:

For proposed routes of tankers, a thorough statement of numbers, tonnage and registry of all tankers bound for Juan de Fuca Strait as well as best approximations of all other marine traffic expected along such routes.

TANKER ACCIDENTS:

Based on world historic records, a clear statement of probability of tanker involvement in collision, grounding, sinking, oil spill, fire, explosion within 200 miles of the west coast of Canada and the U.S.A.

BIOLOGICAL, SOCIAL AND ECONOMIC IMPACTS:

Based on the foregoing considerations, an adequate D.E.S. risk analysis would assess both the short-term, catastrophic and long-term, chronic impacts of the proposed tanker traffic, not only in the vicinity of the proposed port, but along the entire route that lies within 200 miles of the west coast of Alaska, B.C. and Washington.

2. EVALUATION OF CANADIAN FISHERY

We note with great concern that the D.E.S. Map Addendum, which contains 13 maps outlining marine resources (pp. 26 - 51), acknowledges the existence in Canadian waters of only one species - the killer whale! (p 44). We submit that this is a serious deficiency in the D.E.S., which should have incorporated data that was readily available (e.g. Canada Department of Fisheries and Environment, Environment Protection Service, West Coast Offshore Environment, a series of 9 maps)

A yet greater deficiency in the D.E.S. data is revealed in Table 2-1-1-15 - 3, p. 2 - 34, in which the 1977 fishery in waters adjacent to Vancouver Island is evaluated at only $6.9 million.

The D.E.S. cites as the source of this data an anonymous letter of August 30, 1978 from the Department of Fisheries and Environment. However, we find the following information in Fisheries and Environment Canada, Annual Summary of British Columbia Catch Statistics 1977, dated March 20,1978:

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CONT

- 4 -

②

1. Salmon Prices:

The landed value of salmon by species listed in these catch statistics is based on prices shown in red ink on the attached copy of page 7. It should be noted that these are the minimum prices negotiated before the fish were caught. Actual prices paid to fishermen were considerably greater, by as much as a factor of two. Moreover, the true value of the salmon fishery to the Canadian economy would be between 3 and 4 times the actual landed value.

2. Landed Value of Canadian Salmon

For purposes of comparison with D.E.S. Table 2-1-1-15 - 3 we use the ultra-conservative salmon prices referred to above. On the attached copy of page 9 of the 1977 B.C. Catch Statistics document, we show in red our calculation of the 1977 salmon catch by area. The attached "Statistical Map" indicates that areas 17 - 20 correspond to the four areas listed in D.E.S. Table 2.1.1. 15 - 3. Please note that the value of salmon alone in 1977, by our calculation, using the very conservative price assumptions, exceeds $10 million, in contrast to the D.E.S. figure of $7,695 million!

We hasten to add, moreover, that the D.E.S. implicitly assumes that neither the Fraser River fishery nor the west coast of Vancouver Island fishery would be affected by the Northern Tier Pipeline proposal. We submit that this is an indefensible assumption. Indeed, it is our view that any or all of these areas would be seriously impacted by west coast tanker accidents. As our calculations on the attached copy of page 9, and the Statistical Map indicate, the 1977 minimum landed value of salmon alone in the areas of high risk exceeded $40 million.

In view of the fact that the D.E.S. grossly underestimates the value of the Canadian fishery that is at risk, we urge that the F.E.S. include an accurate and thoroughly documented evaluation of the landed value and the true value of the total fishery resources of areas 17 - 29 inclusive.

3. In our view, the acknowledgment (D.E.S. p. 3 - 49) of oil spills envisaged in various scenarios, as depicted in pages 3 - 19 to 3 - 24, fails to assess the risks to Canadian marine resources. We submit that a thorough risk analysis should have been included in the D.E.S., and would urge that the F.E.S. include:

(a) Full disclosure of the rationale, including all assumptions upon which each scenario is based.

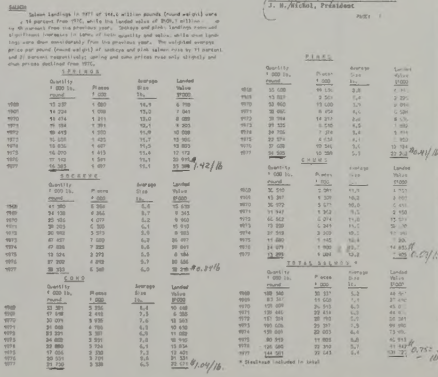
(b) A clear statement of the full range of variables used in the computer simulations.

(c) A range of scenarios which includes in-transit spill risks for all sizes of tankers at various points along the British Columbia coast as well as those within Juan de Fuca Strait.

Assessment of both the short-term and long-term impacts upon the marine ecosystem of spills of a full range of volume and type of crude oil.

Submitted by: United Fishermen & Allied Workers Union

J. H. Nichol, President



SALMON

SPRINGS

1.42/lb

SOCKEYE

$0.84/lb

COHO

$1.04/lb.

PINKS

$0.41/lb

CHUMS

0.57/lb

TOTAL SALMON*

$0.75/lb

* Steelhead included in total

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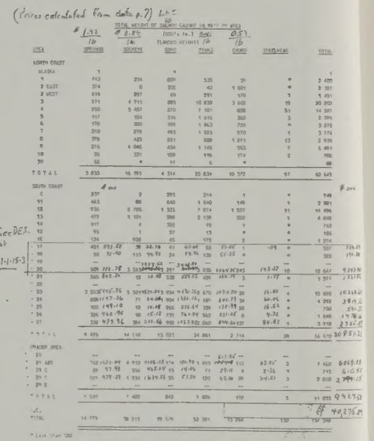
CONT



(Prices calculated from data p.7)

TOTAL WEIGHT OF SALMON CAUGHT IN 1977 BY AREA
(000's lb.)
(LANDED WEIGHT)

$1.42/lb $0.84/lb $1.04/lb 0.41/lb 0.57/lb

AREA SPRINGS SOCKEYE COHO PINKS CHUM STEELHEAD TOTAL

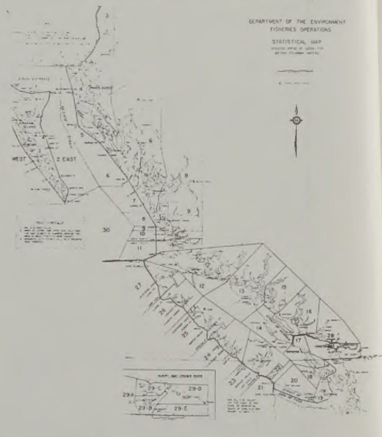
NORTH COAST

SOUTH COAST

See DES. Tab 2.1.1.15-3

$40,275 M

* Less than 500



DEPARTMENT OF THE ENVIRONMENT
FISHERIES OPERATIONS
STATISTICAL MAP

References Cited

Canada Department of Fisheries and Environment, Environment Protection Service, West Coast Offshore Environment, July 1978.

Fisheries and Environment Canada, 1977. Annual Summary of British Columbia Catch Statistics, March 20,1978.

Wang, E. and B. Mawhinney, 1978 Recent developments in international law: the impact on Canadian policy and legislation. Environment Canada, Regional Program Report 78-23, prepared for: West Coast Oil Ports Inquiry, A. R. Thompson, Commissioner.

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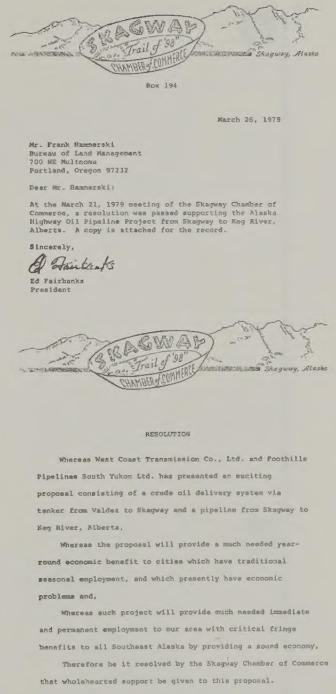

SKAGWAY
"Trail of '98"
CHAMBER of COMMERCE
Skagway, Alaska

Box 194

March 26, 1979

Mr. Frank Hammerski
Bureau of Land Management
700 NE Multnoma
Portland, Oregon 97232

Dear Mr. Hammerski:

At the March 21, 1979 meeting of the Skagway Chamber of Commerce, a resolution was passed supporting the Alaska Highway Oil Pipeline Project from Skagway to Keg River, Alberta. A copy is attached for the record.

Sincerely,

Ed Fairbanks
President

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SKAGWAY
"Trail of '98"
CHAMBER of COMMERCE
Skagway, Alaska

RESOLUTION

Whereas West Coast Transmission Co., Ltd. and Foothills Pipelines South Yukon Ltd. has presented an exciting proposal consisting of a crude oil delivery system via tanker from Valdez to Skagway and a pipeline from Skagway to Keg River, Alberta,

Whereas the proposal will provide a much needed year-round economic benefit to cities which have traditional seasonal employment, and which presently have economic problems and,

Whereas such project will provide much needed immediate and permanent employment to our area with critical fringe benefits to all Southeast Alaska by providing a sound economy,

Therefore be it resolved by the Skagway Chamber of Commerce that wholehearted support be given to this proposal.

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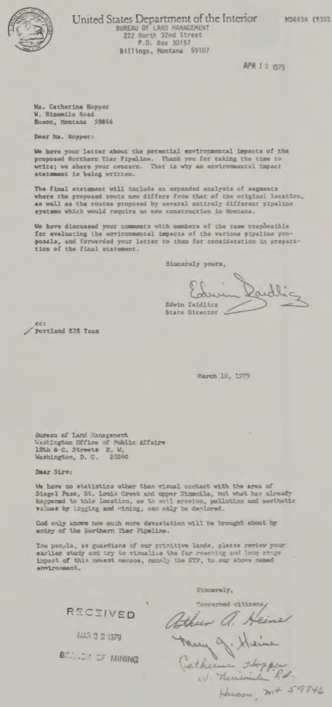

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

M36936 (930)

APR 10 1979

Ms. Catherine Hopper
W. Ninemile Road
Huson, Montana 59846

Dear Ms. Hopper:

We have your letter about the potential environmental impacts of the proposed Northern Tier Pipeline. Thank you for taking the time to write; we share your concern. That is why an environmental impact statement is being written.

The final statement will include an expanded analysis of segments where the proposed route now differs from that of the original location, as well as the routes proposed by several entirely different pipeline systems which would require no new construction in Montana.

We have discussed your comments with members of the team responsible for evaluating the environmental impacts of the various pipeline proposals, and forwarded your letter to them for consideration in preparation of the final statement.

Sincerely yours,

Edwin Zaidlicz
State Director

cc:
✓ Portland EIS Team

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March 10, 1979

Bureau of Land Management
Washington Office of Public Affairs
18th & C. Streets N. W.
Washington, D. C. 20240

Dear Sirs:

We have no statistics other than visual contact with the area of Siegel Pass, St. Louis Creek and upper Ninemile, but what has already happened to this location, as to soil erosion, pollution and aesthetic values by logging and mining, can only be deplored.

God only knows how much more devastation will be brought about by entry of the Northern Tier Pipeline.

You people, as guardians of our primitive lands, please review your earlier study and try to visualize the far reaching and long range impact of this newest menace, namely the NTP, to our above named environment.

Sincerely,

Concerned citizens,

Arthur A. Heine
Mary J. Heine
Catherine Hopper
W. Ninemile Rd.
Huson, MT 59846

RECEIVED
MAR 22 1979
BR[illegible] OF MINING

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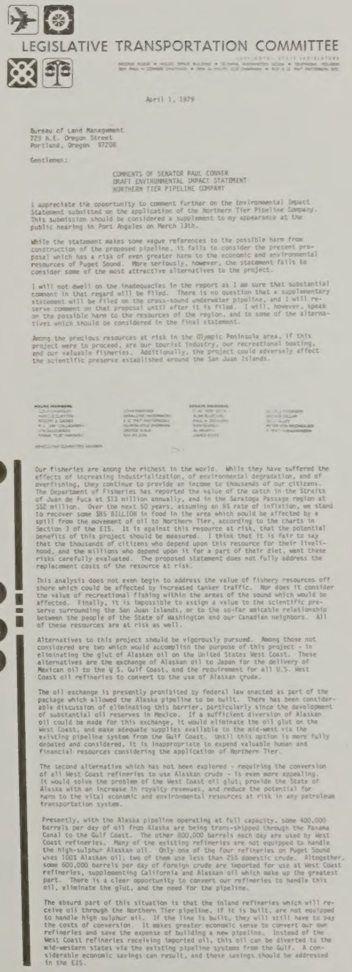
**180**



LEGISLATIVE TRANSPORTATION COMMITTEE

April 1, 1979

Bureau of Land Management
729 N.E. Oregon Street
Portland, Oregon 97208

Gentlemen:

COMMENTS OF SENATOR PAUL CONNER
DRAFT ENVIRONMENTAL IMPACT STATEMENT
NORTHERN TIER PIPELINE COMPANY

I appreciate the opportunity to comment further on the Environmental Impact Statement submitted on the application of the Northern Tier Pipeline Company. This submission should be considered a supplement to my appearance at the public hearing in Port Angeles on March 13th.

While the statement makes some vague references to the possible harm from construction of the proposed pipeline, it fails to consider the present proposal which has a risk of even greater harm to the economic and environmental resources of Puget Sound. More seriously, however, the statement fails to consider some of the most attractive alternatives to the project.

I will not dwell on the inadequacies in the report as I am sure that substantial comment in that regard will be filed. There is no question that a supplementary statement will be filed on the cross-sound underwater pipeline, and I will reserve comment on that proposal until after it is filed. I will, however, speak on the possible harm to the resources of the region, and to some of the alternatives which should be considered in the final statement.

Among the precious resources at risk in the Olympic Peninsula area, if this project were to proceed, are our tourist industry, our recreational boating, and our valuable fisheries. Additionally, the project could adversely affect the scientific preserve established around the San Juan Islands.

① Our fisheries are among the richest in the world. While they have suffered the effects of increasing industrialization, of environmental degradation, and of overfishing, they continue to provide an income to thousands of our citizens. The Department of Fisheries has reported the value of the catch in the Straits of Juan de Fuca at $13 million annually, and in the Saratoga Passage region at $52 million. Over the next 50 years, assuming an 8% rate of inflation, we stand to recover some $85 BILLION in food in the area which would be affected by a spill from the movement of oil to Northern Tier, according to the charts in Section 3 of the EIS. It is against this resource at risk, that the potential benefits of this project should be measured. I think that it is fair to say that the thousands of citizens who depend upon this resource for their livelihood, and the millions who depend upon it for a part of their diet, want these risks carefully evaluated. The proposed statement does not fully address the replacement costs of the resource at risk.

② ③ ④ This analysis does not even begin to address the value of fishery resources off shore which could be affected by increased tanker traffic. Nor does it consider the value of recreational fishing within the areas of the sound which would be affected. Finally, it is impossible to assign a value to the scientific preserve surrounding the San Juan Islands, or to the so-far amicable relationship between the people of the State of Washington and our Canadian neighbors. All of these resources are at risk as well.

⑤ Alternatives to this project should be vigorously pursued. Among those not considered are two which would accomplish the purpose of this project - in eliminating the glut of Alaskan oil on the United States West Coast. These alternatives are the exchange of Alaskan oil to Japan for the delivery of Mexican oil to the U.S. Gulf Coast, and the requirement for all U.S. West Coast oil refineries to convert to the use of Alaskan crude.

The oil exchange is presently prohibited by federal law enacted as part of the package which allowed the Alaska pipeline to be built. There has been considerable discussion of eliminating this barrier, particularly since the development of substantial oil reserves in Mexico. If a sufficient diversion of Alaskan oil could be made for this exchange, it would eliminate the oil glut on the West Coast, and make adequate supplies available to the mid-west via the existing pipeline system from the Gulf Coast. Until this option is more fully debated and considered, it is inappropriate to expend valuable human and financial resources considering the application of Northern Tier.

The second alternative which has not been explored - requiring the conversion of all West Coast refineries to use Alaskan crude - is even more appealing. It would solve the problem of the West Coast oil glut, provide the State of Alaska with an increase in royalty revenues, and reduce the potential for harm to the vital economic and environmental resources at risk in any petroleum transportation system.

Presently, with the Alaska pipeline operating at full capacity, some 400,000 barrels per day of oil from Alaska are being trans-shipped through the Panama Canal to the Gulf Coast. The other 800,000 barrels each day are used by West Coast refineries. Many of the existing refineries are not equipped to handle the high-sulphur Alaskan oil. Only one of the four refineries on Puget Sound uses 100% Alaskan oil; two of them use less than 25% domestic crude. Altogether, some 600,000 barrels per day of foreign crude are imported for use at West Coast refineries, supplementing California and Alaskan oil which make up the greatest part. There is a clear opportunity to convert our refineries to handle this oil, eliminate the glut, and the need for the pipeline.

The absurd part of this situation is that the inland refineries which will receive oil through the Northern Tier pipeline, if it is built, are not equipped to handle high sulphur oil. If the line is built, they will still have to pay the costs of conversion. It makes greater economic sense to convert our own refineries and save the expense of building a new pipeline. Instead of the West Coast refineries receiving imported oil, this oil can be diverted to the mid-western states via the existing pipeline systems from the Gulf. A considerable economic savings can result, and these savings should be addressed in the EIS.

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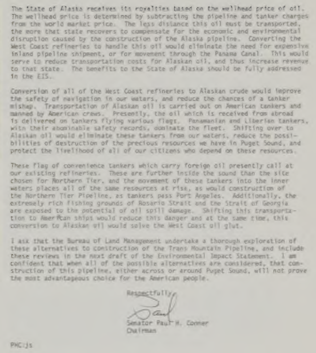


⑤ The State of Alaska receives its royalties based on the wellhead price of oil. The wellhead price is determined by subtracting the pipeline and tanker charges from the world market price. The less distance this oil must be transported, the more that state recovers to compensate for the economic and environmental disruption caused by the construction of the Alaska pipeline. Converting the West Coast refineries to handle this oil would eliminate the need for expensive inland pipeline shipment, or for movement through the Panama Canal. This would serve to reduce transportation costs for Alaskan oil, and thus increase revenue to that state. The benefits to the State of Alaska should be fully addressed in the EIS.

Conversion of all of the West Coast refineries to Alaskan crude would improve the safety of navigation in our waters, and reduce the chances of a tanker mishap. Transportation of Alaskan oil is carried out on American tankers and manned by American crews. Presently, the oil which is received from abroad is delivered on tankers flying various flags. Panamanian and Liberian tankers, with their abominable safety records, dominate the fleet. Shifting over to Alaskan oil would eliminate these tankers from our waters, reduce the possibilities of destruction of the precious resources we have in Puget Sound, and protect the livelihood of all of our citizens who depend on these resources.

These flag of convenience tankers which carry foreign oil presently call at our existing refineries. These are further inside the sound than the site chosen for Northern Tier, and the movement of these tankers into the inner waters places all of the same resources at rise, as would construction of the Northern Tier Pipeline, as tankers pass Port Angeles. Additionally, the extremely rich fishing grounds of Rosario Strait and the Strait of Georgia are exposed to the potential of oil spill damage. Shifting this transportation to American shipt would reduce this danger and at the same time, this conversion to Alaskan oil would solve the West Coast oil glut.

I ask that the Bureau of Land Management undertake a thorough exploration of these alternatives to construction of the Trans Mountain Pipeline, and include these reviews in the next draft of the Environmental Impact Statement. I am confident that when all of the possible alternatives are considered, that construction of this pipeline, either across or around Puget Sound, will not prove the most advantageous choice for the American people.

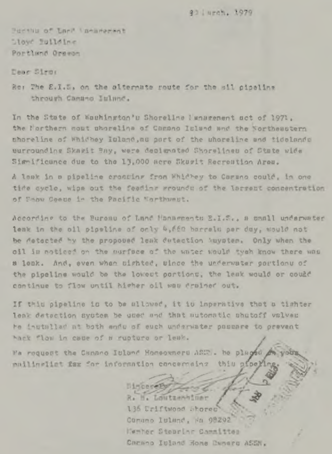
Respectfully,

Paul

Senator Paul H. Conner
Chairman

PHC:js

L-2



23 March, 1979

Bureau of Land Management
Lloyd Building
Portland Oregon

Dear Sirs:

Re: The E.I.S. on the alternate route for the oil pipeline through Camano Island.

In the State of Washington's Shoreline Management act of 1971, the Northern most shoreline of Camano Island and the Northeastern shoreline of Whidbey Island, as part of the shoreline and tidelands surrounding Skagit Bay, were designated Shorelines of State wide Significance due to the 13,000 acre Skagit Recreation Area.

A leak in a pipeline crossing from Whidbey to Camano could, in one tide cycle, wipe out the feeding grounds of the largest concentration of Snow Geese in the Pacific Northwest.

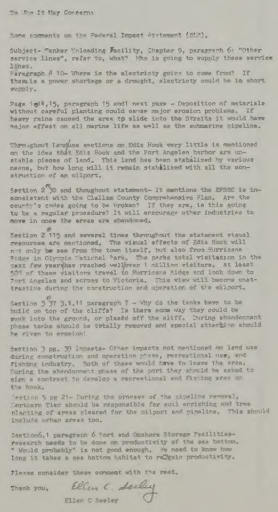
According to the Bureau of Land Managements E.I.S., a small underwater leak in the oil pipeline of only 4,660 barrels per day, would not be detected by the proposed leak detection system. Only when the oil is noticed on the surface of the water would they know there was a leak. And, even when sighted, since the underwater portions of the pipeline would be the lowest portions, the leak would or could continue to flow until higher oil was drained out.

If this pipeline is to be allowed, it is imperative that a tighter leak detection system be used and that automatic shutoff valves be installed at both ends of each underwater passage to prevent back flow in case of a rupture or leak.

We request the Camano Island Homeowners ASSN. be placed on your mailinglist for information concerning this pipeline.

Sincerely,
R. H. Loutzenhiser
136 Driftwood Shores
Camano Island, Wa 98292
Member Steering Committee
Camano Island Home Owners ASSN.

L-3



To Who It May Concern:

Some comments on the Federal Impact Statement (BLM).

Subject- Tanker Unloading Facility, Chapter 9, paragraph 6- "Other service lines", refer to, what? Who is going to supply these service lines.
Paragraph # 10- Where is the electricty going to come from? If there is a power shortage or a drought, electricty could be in short supply.

Page 1-14,15, paragraph 15 and next page - Deposition of materials without careful planting could cause major erosion problems. If heavy rains caused the area to slide into the Straits it would have major effect on all marine life as well as the submarine pipeline.

Throughout landuse sections on Ediz Hook very little is mentioned on the idea that Ediz Hook and the Port Angeles harbor are unstable pieces of land. This land has been stabalized by various means, but how long will it remain stabilized with all the construction of an oilport.

Section 2 30 and thoughout statement- It mentions the EPSSC is inconsistent with the Clallam County Comprehensive Plan. Are the county's codes going to be broken? If they are, is this going to be a regular procedure? It will encourage other industries to move in once the areas are abandoned.

Section 2 115 and several times throughout the statement visual resources are mentioned. The visual effects of Ediz Hook will not only be see from the town itself, but also from Hurricane Ridge in Olympic National Park. The parks total visitation in the past few years has reached well over 1 million visitors. At least 50% of these visitors travel to Hurricane Ridge and look down to Port Angeles and across to Victoria. This view will become unattractive during the construction and operation of the oilport.

Section 3 37 3.1.11 paragraph 7 - Why do the tanks have to be build on top of the cliffs? Is there some way they could be sunk into the ground, or placed off the cliff. During abandonment phase tanks should be totally removed and special attention should be given to erosion!

Section 3 pg. 39 Impacts- Other impacts not mentioned on land use during construction and operation phase, recreational use, and fishing industry. Both of these would have to leave the area. During the abandonment phase of the port they should be asked to sign a contract to develop a recreational and fishing area on the hook.

Section 5 pg 21- During the process of the pipeline removal, Northern Tier should be responsible for soil enriching and tree planting of areas cleared for the oilport and pipeline. This should include urban areas too.

Section6.1 paragraph 6 Port and Onshore Storage Facilities- research needs to be done on productivity of the sea bottom. " Would probably" is not good enough. We need to know how long it takes a sea bottom habitat to regain productivity.

Please consider these comment with the rest.

Thank you, Ellen C. Seeley
Ellen C Seeley

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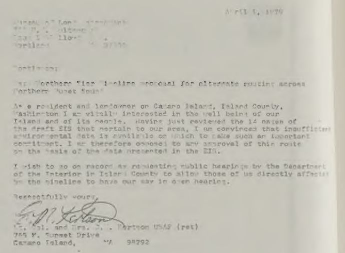


April 1, 1979

Bureau of Land Management
[illegible]
[illegible] Lloyd [illegible]
Portland [illegible]

Gentlemen:

Re: Northern Tier Pipeline proposal for alternate routing across Northern Puget Sound

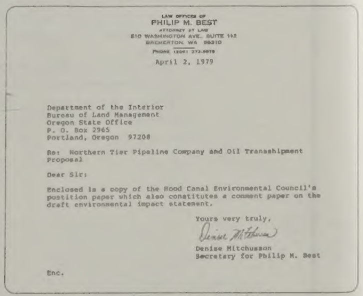
As a resident and landowner on Camano Island, Island County, Washington I am vitally interested in the well being of our Island and of its people. Having just reviewed the 14 pages of the draft EIS that pertain to our area, I am convinced that insufficient environmental data is available on which to make such an important commitment. I am therefore opposed to any approval of this route on the basis of the data presented in the EIS.

I wish to go on record as requesting public hearings by the Department of the Interior in Island County to allow those of us directly affected by the pipeline to have our say in open hearing.

Respectfully yours,

Lt. Col. and Mrs. E. M. Kertson USAF (ret)
765 N. Sunset Drive
Camano Island, WA 98292

L-5



LAW OFFICES OF
PHILIP M. BEST
ATTORNEY AT LAW
510 WASHINGTON AVE. SUITE 112
BREMERTON, WA 98310
PHONE (206) 373-8879

April 2, 1979

Department of the Interior
Bureau of Land Management
Oregon State Office
P. O. Box 2965
Portland, Oregon 97208

Re: Northern Tier Pipeline Company and Oil Transshipment Proposal

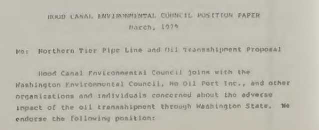
Dear Sir:

Enclosed is a copy of the Hood Canal Environmental Council's postition paper which also constitutes a comment paper on the draft environmental impact statement.

Yours very truly,

Denise Mitchusson
Secretary for Philip M. Best

Enc.



HOOD CANAL ENVIRONMENTAL COUNCIL POSITION PAPER
March, 1979

Re: Northern Tier Pipe Line and Oil Transshipment Proposal

Hood Canal Environmental Council joins with the Washington Environmental Council, No Oil Port Inc., and other organizations and individuals concerned about the adverse impact of the oil transshipment through Washington State. We endorse the following position:

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CONT

(1) No increased transshipment of oil through the state of Washington should occur unless and until it is established that:

a. It is in the overriding national interest;

b. The adverse impacts are less damaging with respect to the environment, energy conservation and the economy than transshipment outside Washington State;

c. The above conditions are established to the satisfaction of the President and Congress.

(2) Any transshipment method and route selected through Washington should have the least possible adverse effect on (in decreasing order of significance) the natural environment, energy consumption, and the economic/social consequences.

We find an appalling lack of evidence that the Northern Tier Pipeline proposal could meet the reasonable conditions outlined in this position.

We all recognize the need to move Alaska crude oil to refineries and the refined products to the ultimate consumers. The issues are how and where and (to a lesser extent) when.

Debate on major alternative transshipment routes includes discussion of: (1) an oil pipeline from Alaska along the Alaskan Highway (Northeast Energy Co.); (2) tankers from Valdez to Pt. Angles and then by pipeline to the Midwest (Northern Tier Pipeline Co.); (3) tankers from Valdez to Kitimat, B.C., and then by pipeline to the midwest (Kitimat Pipe Line Ltd.); (4) tankers from Valdez to Long Beach, California, and then by pipeline to eastern refineries (SOHIO); (6) Tankers to Japan in exchange for Japanese purchased mid-east oil in eastern refineries; (7) tankers to Panama and then by pipeline or small tanker to the east coast of Panama with large tankers completing the trip to east coast refineries; and so on.

Only two of the above proposals involve transshipment through Washington State. There is minimal comparative analysis among these alternatives, and certainly not enough to point to a conclusion that the Washington State routes are dictated by overriding national interest and have less damaging consequences than the others.

Neither the President or Congress have mandated a transshipment route through Washignton State. Until they do, we should resist it. The local adverse impacts to the environment and economy far outweigh the local benefits. Only when it is clearly shown that the aggregate adverse impacts of a transshipment system which goes through Washington State are less than the aggregate adverse impacts under all reasonable alternatives should we agree to transshipment through Washington.

The Northern Tier proposal is of particular concern to the Hood Canal Environmental Council. Hood Canal is a 61-mile-long, fishhook-shaped fjord. Heavily forrested Olympic Mountains form a towering, craggy background on the west side of the canal. This area of unexcelled natural beauty is very vulnerable to contamination anywhere in the Canal because of its extremely slow flushing rate. While most of Puget Sound experiences a complete flushing and exchange of water within a few days, flushing in Hood Canal takes at least a year and, for southern Hood Canal in Mason County, even longer.

Hood Canal is an important area for sports and commercial fishing. The percentage of the Hood Canal catch compared to all of Puget Sound (including Hood Canal) is illustrated as follows: shellfish (26.5%), shrimp (70.5%), recreational intertidal clams (27.7%), geoduck (26.5%), salmon production (11.8%), total fisheries (16.8%). Commercial harvesting of Pacific oyster seed and recreational harvesting of intertidal oysters are unique to Hood Canal within the Puget Sound system.

The Northern Tier proposed pipeline route from Port Angeles south along the west side of Hood Canal would traverse every river and stream flowing from the Olympics eastward. Northern Tier has applied for Army Corps permits to cross these major rivers flowing into Hood Canal: Little Quilcene, Big Quilcene, Dosewallips and Duckabush in Jefferson County; Hamma Hamma and Snohomish in Mason County. Numerous smaller (but important) streams, such as Waketickeh Creek, John Creek, Jorsted Creek, Eagle Creek, Lilliways Creek, Sund Creek, Miller Creek and Finch Creek in Mason County and many others in Jefferson County also lie within the proposed pipeline corridor. The importance and sensitivity of these rivers and streams, and the bays and estuaries they form along Hood Canal, is hardly touched upon in BLM's Environmental Impact Statement or in Northern Tier's Certification Application to the Energy Facility Site Evaluation Council.

What are the oil leakage risks along Hood Canal, as the pipeline traverses the canyons, streams and rugged terrain? A break could go undetected for long enough to leak over a million gallons into a tributary of Hood Canal. Chronic low level seepage may do considerable damage before being detected. What damage would be done? How does this damage compare with that from a spill of comparable size along alternate routes--such as the Trans Mountain proposal or a pipeline under Puget Sound to Whidby Island? What would be the comparable costs, duration, and environmental impact? Answers are needed, but not yet furnished.

Construction of the pipeline will inevitibly result in a great deal of erosion, causing turbidity in streams and estuaries of Hood Canal. How much would be caused and at what expense to marine life has not been disclosed, but needs to be if an evaluation is to be made. Northern Tier would undoubtedly attempt to avoid all environmentally protective measures which are not also to its economic benefit, and for this reason alternative routes requiring less costly mitigating measures for the same amount of protection should be fully considered. We don't believe this has been done.

The proposed pipeline route passes through earthquake fault zones along Hood Canal, especially near the Hamma Hamma River. This deserves special attention, which appears to have been lacking.

We fully concur with the conclusion of Northwest Environmental consultants in their evaluation: "However, the relatively pristine areas and vital resources of Hood Canal make selection of the proposed East Olympic Peninsula Route questionable at best and probably unadvisable. We recommend that Mason County contest his route as not being in the best long-term interests of the county."

Respectfully submitted,

Donna M. Simmons, President
Hood Canal Environmental Council

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L-6

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

APR 3 - 1979

MEMORANDUM

To : State Director, Bureau of Land Management, Portland, Oregon

From : Acting Associate Director, Fish and Wildlife Service, Washington, D.C.

Subject: Review of Draft Environmental Statement on the Crude Oil Transportation System, Port Angeles, Washington to Clearbrook Minnesota (As Proposed by Northern Tier Pipeline Co.) (EC-79/9)

Following are our comments on the subject document.

General Comments

Contrary to the discussions presented in this document, we believe the impacts to fish and wildlife resources will be major or long lasting. Many of the impacts cannot be determined from a cursory examination and would require thorough research and documentation.

This environmental impact statement (EIS) lacks adequate information for a full understanding and an evaluation of how the construction and operation of the Northern Tier Pipeline may affect fish and wildlife resources. The general format was attractive but cumbersome and confusing. It was difficult to keep track of resources, impacts, and mitigating measures because of the sectionalizing of the pipelines route. Specific resources should be discussed in a manner where fish values, wildlife values, etc. are tied together. We realize this would deviate from the standard format, but we believe that the format does not fit a project of this magnitude and diversity.

We would suggest a multi-volumed document with a summary that would serve as the general EIS for the public. Without a change in format the needed expansion of detail in the description, environmental impacts, mitigating measures, and alternatives sections would make the document unmanageable. All impacts sections (sections 3, 5, 6, and 7) should be discussed in unison in one volume. The map addendum should be retained as a supplement to the summary.

The environmental section is too general and does not adequately discuss terrestrial vegetation or nonendangered species of wildlife. The description of fisheries should include all streams we requested to be identified in the description section. It should also identify those species using each stream so the impacts relating to time of construction can be evaluated by reviewers. There is too much dependence on the map addendum to document environmental values, but the maps are not detailed or site-specific enough to determine specific impacts. In addition, it was not possible to examine alternate routes thoroughly since maps for these routes were not detailed enough and the exact route location was not easily determined.

CONT

Known terrestrial animal ranges, migration routes and other special use areas such as calving grounds, and wintering areas should be identified and mapped for the entire route. Similar coverage should also be provided for other wildlife groups (especially waterfowl) and important habitat areas.

The section on impacts is particularly weak because it addresses occurrences or events, but seldom addresses what those events will do in regard to fish, wildlife or related sport or commercial ventures. An accident, whether large or small is an occurrence; what effects this will have on resources is not discussed, in most instances, and when it is discussed it is too general.

If the impacts section is improved the unavoidable adverse impacts and irreversible and irretrievable commitment of resources sections should be able to be improved. Statements are so nonspecific they have no substance and therefore are meaningless when evaluating the project's real costs to the environment.

The mitigating measures section has almost no substance. We have made some specific comments but they do not reflect our concern over this section. We suggest that the format for mitigation be patterned after the Alaska Pipeline and the Alaskan Highway Gas Pipeline environmental statements.

The EIS addresses the obvious alternatives such as alternate fuel suppliers, using existing pipelines, and major route segment alternatives. However, the statement failed to compare impacts for alternatives such as:

1. Alternate stream crossing sites addressing availability of spawning habitat, high aquatic insect production areas, acres of riparian vegetation cleared, and presence of riparian wetlands.

2. Alternate construction schedules should be considered in order to avoid disturbance of waterfowl nesting and fish spawning periods.

3. Alternate centerline alignments avoiding wetlands should be considered instead of the straight line approach.

The pipeline route crosses numerous waterways subject to a variety of regulations for protecting fish and wildlife resources. Accordingly, our comments do not preclude an additional and separate evaluation by the Fish and Wildlife Service, pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), if eventual project development requires a permit from the U.S. Coast Guard and/or the Corps of Engineers, U.S. Army (Sections 9 and 10 of the River and Harbor Act of 1899 and Section 404 of P.L. 92-500). All such permits are subject to separate review by the Service under existing statutes, executive orders, memorandum of agreement and other authorities. In review of permit applications, the Fish and Wildlife Service may concur, with or without stipulations, or object to the proposed work, depending on specific construction practices which may impact fish and wildlife resources. Additional and independent actions may also be required in compliance with Executive Order 11990 for the protection of wetlands.

Additional general comments specifically relating to the routing of the pipeline through the various States are identified below by State.

WASHINGTON

The description of the proposal was inconsistent and left out major areas of concern regarding Green Point and the stream crossings on the west side of Hood Canal. Information necessary to evaluate the environment affected and to determine anticipated impacts should include a description of all streams with significant fish or wildlife resources, not just those classified by the U.S. Geological Survey (USGS). Within this description the following should be included:

1. Distance of the crossing from the mouth of the stream;

2. Gradient in degrees of slope of the embankments on both sides of the streams;

3. Vegetation within the flood plains of the stream crossings;

4. Identified shallow water aquifers at all stream crossings;

5. A description of crossing techniques, dredging, handling of spoils, and timing for each stream.

① Waterfowl use areas should be more descriptively displayed. This should include winter concentration areas along Hood Canal where there is a possibility that an accident could affect open waters and identified harlequin, bufflehead, and wood duck nesting areas in the streams to be crossed.

Because of the proximity to Hood Canal the description of both sport and commercial shellfish should be described in more detail.

Further comments on alternatives will be forwarded for the Washington section at a later date. Northern Tier Pipeline Co. (NTPC) has bombarded Washington with alternatives, route changes, and conceptual changes for the past year. At present it is difficult to determine what they mean to do in terms of crossing Puget Sound.

Two things that must be addressed in existing route alternatives are relocating crossings along the west side of Hood Canal and alternative methods to crossing streams.

IDAHO

Stream alterations in the State of Idaho are subject to the provisions of the Idaho Stream Protection Act requiring permit application for the pipeline crossings. Applications should be made to: State of Idaho, Department of Water Resources, Northern Region, Route #5, Box 203, Government Way, Coeur d'Alene, Idaho 83301.

② Since the Jackass Ridge route is the most likely route across the State of Idaho, the discussion of impacts of this alternative to fish and wildlife resources should be expanded. More information is needed on effects the action will have on osprey populations on the St. Joe River and Coeur d'Alene Lake. The St. Joe River arm of Coeur d'Alene Lake supports a portion of the largest nesting concentrations of osprey in the western United States. The document should discuss the impacts on nesting, rearing, and feeding of this important raptor.

MONTANA

It appears that the proposed pipeline route would cross Fish and Wildlife Service flowage easement lands along Willow Creek which flows into Mason Lake. While a route south of the refuge would have been preferred from a refuge standpoint, it does not appear that laying the pipe along the proposed route will cause critical problems, providing that proper siltation control, revegetation, and other mitigating measures are implemented.

CONT

The EIS indicates (page 1-24) that main line valves will be placed along each side of a water crossing that is more than 100 feet wide from high-water mark to high water-mark and along each side of a reservoir holding water for human consumption. In order to provide a greater degree of protection to aquatic and semiaquatic resources, we recommend that shut-off valves be installed on both sides of streams 30 feet or more in width and all other bodies of water considered by responsible State or Federal resource agency representatives to be of significant value. In Montana, it does not appear that any reservoir managed by the Fish and Wildlife Service will be crossed.

The Service earlier recommended that consideration be given to installing a double pipe system (pipe within a pipe) as a precautionary safety measure at all permanent stream crossings. Unless this proposal has been found to be unsound from an engineering standpoint, the concept still appears to have some merit.

NORTH DAKOTA

The description of the environment in North Dakota is totally inadequate. Without detailed biological assessments, identifying the fish and wildlife resources, the impacts cannot be addressed.

③ The values of woodland and grassland habitats to many wildlife species in North Dakota were not adequately presented. The value of woodland habitat due to its scarcity has been overlooked. The impacts should be addressed relating to the destruction of this limited habitat in North Dakota.

To expand upon this lack of information, major and minor river crossings appear to have been listed only as a matter of formality. A simple table is used in an attempt to illustrate its importance as a sport fishery or for its forage fish production. Characteristics for major streams were summarized in only one or two paragraphs and no alternate crossing sites are proposed. Minor streams crossed were only listed and no biological assessments were conducted. A complete survey of aquatic resources is needed at proposed and alternate stream crossing sites.

MINNESOTA

The EIS is generally adequate with respect to the description of the proposal's potential impacts upon fish and wildlife resources in Minnesota. However, we feel the final EIS should address the impacts of construction of additional storage facilities at Clearbrook. Although these facilities are not a part of NTPC's plans a definite need for such facilities will result and the potential impacts of construction of these expanded storage facilities should be described.

④ Specific Comments

Page 1-5, Table 1.3-1. We recommend adding the phrase "recommends modification prior to approval" between the words "approves" and "or recommends denial" under the remarks column of the Fish and Wildlife Service section.

Page 1-11, column 2, par. 2. "Preliminary studies by NTPC indicate that leaks as small as 50 to 100 barrels or 0.07 to 0.14 percent respectively, of the contents of one line could be detected." This statement says nothing. It gives no indication of the time over which lesser quantity leaks could be released without detection, how long it would take after detection for a minimum leak to be repaired or how much oil would be released before repairs were completed. It is also inconsistent with the handling of oil leaks from the pipeline page 3-70, Table 3.2.6.2.

Page 1-11, column 2, par. 4. This indicates that only gross leaks would be noticed by the secondary leak detection system. This should be emphasized in the risk analysis section.

Pages 1-11 and 1-12. There is no discussion of placement of the pipeline up the slope of Green Point, Washington from the underwater pipelines to the storage facility.

Pages 1-14, column 2, par. 3. There is no discussion of determining permeability of the soils in the 190 acre tank farm site and how they intend to protect the identified shallow water aquifers from oil pollution in case of minor spills and/or major spills which are identified in the operations phase of the impact analysis.

Page 1-14, column 2, par. 4. There is no discussion of water purification before discharge. You imply the only thing in the water will be oil, yet in the risk analysis and impact sections you discuss soluble factions. Identify the soluble factions in this water and how they are to be removed.

Page 1-18, column 1, par. 6. The document indicates the pipeline route will skirt the National Bison Range. We assume this means it will not cross any lands associated with the range. The map addendum supplied with the document seems to verify this assumption. If this is not correct, the statement should be clarified and any anticipated effects described.

Page 1-19, column 2, State of North Dakota. Use of the Burlington Northern Railroad route in delivering material for construction of the pipeline could decrease the need for construction of roads and resultant environmental impacts.

Page 1-21, Table 1.4-7, Major Stream and River Crossings. We disagree with the criteria for determining a major stream or river. Many of the rivers or streams have less biological value than smaller streams along the proposed corridor particularly on the west side of Hood Canal, Washington. We believe all streams with significant fish or wildlife values should be considered as major and adequately identified and described in the EIS.

Page 1-22, Table 1.4-8. This table omits five counties in Washington. Refer to our comments for Page 1-21, Table 1.4-7. Many of the unidentified streams are major anadromous spawning streams, trout streams or have other significant wildlife values.

Page 1-24, column 2, par. 2. This statement indicates there are no scrapers in the underwater pipe system. Does this imply problems associated with build up in mainland pipelines are not inherent in the underwater lines and therefore scrapers are not needed? If launching and receiving sites are not located at pump stations the statement should discuss diking and spill protection at these stations.

Page 1-28. The photograph is not representative of what a typical plant with a 42 to 48 inch line will look like. This misrepresents the project extensiveness and the amounts of land such a plant would require.

Page 1-35, par. 3. The statement is made that storage facilities at Clearbrook, Minnesota will have to accommodate an additional 1 million gallons of crude oil. Even though the additional storage facilities are not part of the NTPC's proposal, the need for these facilities would be a direct result of pipeline construction and operation. We feel that the potential impacts of the anticipated storage facilities should be addressed in the final EIS.

Page 1-42. The photograph is not representative of the impacts placing a corridor through a forest with a crawler-dozer will create.

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CONT

④ Page 1-43, Figure 1.4-11. The artist's concept shows a nice flat, cleared area where vehicles and activities are not impacting any resources. This gives a false clean, neat, and unpolluting impression of pipeline laying.

Page 1-44, column 2, par. 5. The EIS indicates that "Any material excavated in the trenching operation and deemed unsuitable for use as back fill would be disposed of in a manner acceptable to the property owner." Excavated material should not be disposed of in wetlands and riparian areas of flood plains, nor in rivers and streams, or on wooded or shrubby areas, even if requested by the land owner. This Federally permitted project should not condone destruction of any valuable and sensitive wildlife areas in any manner not absolutely necessary. The NTPC should also be committed to removing and stockpiling topsoil separately and replacing this after subsoil has been backfilled.

Page 1-44, column 2, par. 6. This system should be considered for stream crossings. Discuss the pros and cons of such a technique.

Pages 1-44 to 1-47. This complete section on pipeline laying is inadequate. It identifies a system of stream crossings that is in violation of some State standards (i.e. Washington Department of Fisheries). It is also too general to quantify the impacts outlined in the impacts section. In addition to measures which are identified in this section for minimizing adverse effects associated with stream crossings, we recommend that consideration be given to the following additional measures:

1. If possible, cross streams perpendicular to the flow and at a location where shear forces are minimal.

2. Employ temporary downstream siltation control measures during stream crossing construction.

3. If pipeline construction is interrupted for any reason after vegetative cover has been removed from the streambanks, implement temporary erosion control measures.

Page 1-45, Figure 1.4-13. The drawing demonstrates inadequacy of identified stream crossing safety precautions. All stream crossings should have automatic shut off valves that are more responsive than the 50 to 100 barrel leak protection under the ground, and which will prevent the types of spills identified in Table 3.2.6.2 page 3-70. This should be included and properly discussed in this section. For further discussion of possible safety precautions in stream crossings see paragraphs 2 and 3 of the Montana General Comments.

Page 1-46, par. 1. The discussed technique violates standard provisions for approval by individual States (i.e. Washington Department of Fisheries). It also would not be approved under Section 404 for any crossings along the west side of Hood Canal, Washington since they all involve "aquatic life indigenous to the water body," (as described in CFR 323.4-3 paragraph 5b.4. of Section 404) which would be impacted; also, many crossings are close enough to the mouths of streams to require permits because of concentrated shellfish production within the anticipated sediment outfall area (CFR 323.4-3, paragraph 2). The fifth sentence reads: "The excavated material would be placed on the stream bottom adjacent to the ditch." The environmental impacts of such an action compared to placing the excavated material above the high waterline should be addressed in the impact section.

Page 1-46, par. 6. There appears to be a contradiction in the statement related to riprapping streambanks at crossing sites. It is stated here that "Riprap or other materials would be placed on the banks for stabilization and to prevent erosion." However, under the heading of "Additional Measures Proposed for Environmental Protection," item 22, page 1-58, the following statement appears: "Streamflow control measures and riprapping will be avoided in all areas of pipeline crossing." These items should be clarified in the final statement.

Page 1-46, par. 9. This reads that bentonite clay could be used if the drainage potential existed. Does this mean that bentonite clay will be used or might be used? The company should commit themselves one way or the other. These construction procedures should be addressed here, not as part of the construction specifications. The "environmental inspector(s)" should come from a State or Federal fish or wildlife or renewable natural resource agency.

Page 1-47, column 1, par. 4. This paragraph does not discuss what will happen to the debris, slag, and contaminants removed from the pipeline. Water withdrawals could conflict with other identified uses at certain time periods. The discussion should identify that water withdrawals will be consistent with water-rights and low flow needs for fisheries. If local streams or rivers are not available for hydrostatic test water, the alternate sources of water should be listed here. If wetlands are considered as alternate source, resultant impacts should be addressed in the impact section.

Page 1-47, column 1, par. 8. The impact of such diversion structures on the watershed area of prairie potholes should be covered in the impact section. This could represent substantial loss of water to wetland basins and consequent impacts. Will the company commit to compensate for such losses? Also, the method of soil stabilization should be discussed here, not as part of the construction specifications.

Page 1-56, par. 4. We prefer the concept agreed to for the Alaska Pipeline. Environmentalists should be from a consulting agency or government agency that work for or are funded by NTPC but are responsible to an over-seeing Federal agency.

Page 1-57, Item 12. There is no discussion about pre-blasting activities to reduce impacts to fish. There are no comments about mitigation of impacts in the mitigation section.

Page 1-58, Item 22. This comment is inconsistent with other statements in the EIS that discuss slope stabilization at stream crossings.

Page 1-59, column 2, par. 2. Special use permits will be required from the Fish and Wildlife Service to cross these lands.

Page 1-61, Table 1.5-1. Clallam County, Washington is not listed in this table.

Page 1-63, 1.6 Legal Constraints. This implies that State and local statutes have no bearing on pipeline construction. A general statement should address other legal requirements that need to be met. Under the list of constraints Executive Order 11990 - Protection of Wetlands, May 24, 1977, should be included.

⑤ Page 2-13, AQUATIC RESOURCES. This section is totally inadequate in describing the aquatic resources of the streams at proposed crossing locations in all the States involved. Included should be detailed descriptions of all water courses in which dredging is necessary. In order to assess the impacts, this discussion should include data on all aquatic resources including aquatic invertebrates. These descriptions should also include any pertinent State classification of streams (i.e. North Dakota's classifications).

⑥ Page 2-19, Biological Components. The impacts on Seibert Creek, Washington are directly connected to the onshore storage facilities and should be addressed under this heading. By separating the two the impacts are clouded.

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⑦ Page 2-21, par. 6 and Page 2-22, par. 1: Refer to Washington Department of Fisheries data and comments on timing. You have reversed the significance of west and east fish values and fisheries. Also, your last sentence is incorrect: The distribution of bottom fish and salmonids represents an area with good habitat or migration routes. Food source or migration holding areas indicates those areas where fish congregate. Areas where fisherman fish is regulated by moorage and other boat access. Good habitat or fish concentration areas within good boat access determines those areas fished.

⑧ Page 2-22, par. 4. Gray whale sitings should not be considered rare but uncommon. Bald eagle activity is dependent on the aquatic habitat for food. Without the unpolluted food source the birds would move from the area.

⑨ Page 2-22, par. 5. Any of these habitats, as designated by Canada, encompassed in any of the hypothetical oil spill trajectories, pages 3-20 to 24 should be mapped and discussed.

⑩ Page 2-25, Table 2.1.1.7-7. Both salt marshes and eelgrass beds are areas of high benthic, invertebrate, and detrital production. Your low evaluation of both gives the general impression that these habitats are of low value to birds. If mud means mudflats you have left out many birds that feed on the organisms and vegetation that lives on mudflats. The Fish and Wildlife Service supplied a number of materials sources that were apparently not used.

⑪ Page 2-26, column 2, Areas of Special Concern. The onshore storage area is part of a limited forested ecosystem that exists in the immediate vicinity. Each year more of this ecosystem is destroyed by housing developments, etc. This diminishing area is the habitat for a number of game and nongame species that are of concern to Washington State. Any diminishing habitat is an area of concern.

⑫ Page 2-37, column 1, par. 4. The waters off Neah Bay, down to Copalis, Washington support a major bottom fishery.

⑬ Page 2-37, column 1, par. 5. The beaches from Taholah to Grays Harbor, Washington are open to the public and have the highest concentration of razor-clam diggers of any beaches in the State. From LaPush to Neah Bay, Washington there are numerous trails and the National Park Service maintains a coastal trail from LaPush to Lake Ozette, Washington. Car access is limited.

⑭ Page 2-37, column 1, par. 7. This habitat supports a major sport fishery. Also the bottom fishery is a major activity with heavy use and high success.

⑮ Page 2-37, column 2, par. 1. North Puget Sound, Washington supports a very important bottom fishery and both commercial and sport herring and smelt fisheries.

⑯ Page 2-37, column 2, par. 5. Moorage should not be an indicator of boating and boat fishing pressure. The number of trailered boats far exceeds moorages. (See the Corps of Engineers' Sequim Bay Marina EIS - EA-77/911 - for pertinent data.)

⑰ Page 2-37. Recreational pursuits completely ignores whale watching and bird watching in this area. There are chartered boat trips off the coast and in Puget Sound for both.

⑱ Page 2-39, Table 2.1.1.15-4. There is updated information on recreational bottom fishing available at the University of Washington.

⑲ Page 2-41, Table 2.1.1.16-7. You omitted sport fishing and general tourism. Those are two of the major businesses in Washington.

⑳ Page 2-57, column 1, par. 4. The major stream category should be expanded to cover all streams with significant fish and wildlife values, i.e. those requiring a Section 404 permit (see page 1-46 par. 1 comments).

Page 2-57, Table 2.1.2.6-1. Same comments as paragraph 4.

㉑ Page 2-57, columns 1 and 2, par. 6. Pipeline construction will have to coincide with fish activity. Construction will not be allowed during anadromous fish migration, spawning, and hatching. Statements that imply positive actions should be consistent with State and Federal regulations and guidelines.

㉒ Page 2-61, column 1, Hamma Hamma River and Skokomish River. Both proposed crossings are close to the mouths of the streams, in marshes under tidal influence. They are close enough to commercial oyster and clambeds to have potentially significant impacts if an accident occurs. Other streams not listed have the same conditions. Alternative routes should be offered to reduce these impacts.

㉓ Page 2-78, column 2, par. 3. Besides a constant flow of sediment-free water there is always a need for sediment-free gravel.

㉔ Page 2-80, Table 2.1.2.6-17. Of the major streams to be crossed, 33 have one or more salmon species and the remainder have trout. All streams with significant anadromous fish populations should be included in the table.

㉕ Page 2-81, Table 2.1.2.6-18. This table is incomplete. It should include another column to address the commercial net fishery at the mouths of streams.

㉖ Page 2-82, Table 2.1.2.6-19. This table does not include salmon rearing streams in eastern Washington. In Footnote 4 on the Cedar River, your 150,000 fish figure is incorrect. From 1972 to 1977 Cedar Creek averaged 219,000 fish. The management goal of 350,000 spawners was met twice during this period.

㉗ Page 2-87, Freshwater Life History Phases. This should include the Yakima and Columbia Rivers.

a Page 2-88, column 2, par. 1, last sentence. See page 2-21 paragraph 6 comments for our concerns relative to this statement.

b Page 2-88, column 2, par. 4. See our comments for page 2-2 paragraph 4 regarding eagles.

㉘ Page 2-89, 2.1.2.8, Terrestrial Vegetation. The entire section is too general. It is impossible to evaluate impacts from such a description. For example, the importance of woodlands, hardwood draws, and grassland habitats in North Dakota should be emphasized. Because of the limited amount of woodland habitat in the State, it should be included as habitat types of special concern. The classification systems are too broad to evaluate.

㉙ Page 2-95, 2.1.2.9, TERRESTRIAL WILDLIFE. The reasoning and data to support the conclusions on which species will be significantly impacted should be given.

㉚ Page 2-98, column 1, Other Species. Under this section it is indicated that "Historically the gray wolf has occurred in Idaho." This species (Canis lupis irremotus) also occurred historically in Montana and sightings still occur in certain areas. The Forest Service has identified as essential wolf habitat some areas within relatively close proximity to the Clark Fork River Valley. However, it does not appear that the project would cause significant adverse effects on the wolf or its habitat. This comment is not to be considered as a "biological opinion" in accordance with Section 7 of the Endangered Species Act.

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㉛ Page 2-98, column 2, par. 1. The wildlife values of the prairie pothole region in North Dakota are given in only one short paragraph. This should be expanded to include the numerous, additional values wetlands have for wildlife, including but not limited to waterfowl.

㉜ Page 2-98, column 2, par. 2. In transferring these data on wetland acres and basins in North Dakota to Bureau of Land Management, we stated: This data is not adequate to predict the number and acreage of wetlands which will be affected by the construction of the proposed pipeline. It only accounts for Type III, IV, and V wetlands. It also only accounts for acreages of wetlands expected to be within the right-of-way boundaries. The additional acres of a wetland, transected by the route, which fall outside of the right-of-way boundary will also be affected. This data does point out the high wetland density along the pipeline route and the need for a complete, on the ground wetland inventory. Such an inventory would allow avoidance of wetlands to be one of the criteria in selecting the final centerline. We pointed out that in several other recent inventories, Type I and II wetlands had made up close to 50 percent of the total wetlands. Bureau of Land Management doubled our figures to account for this; however, this did not account for the acreages of affected wetlands which lie outside of the right-of-way. This is a misleading use of our data and should be corrected.

㉝ Page 2-100, Table 2.1.2.9-3. Formating technique does not adequately address major species concentrations or general seasonal distributions. There are numerous areas of special concern across Washington. The entire east slope of the Olympic Mountains in Washington is significant big game habitat for Roosevelt elk, mountain lion, mountain goat, black-tailed deer and numerous smaller riverine dependent mammals. The mouths of all the streams are important wintering areas for waterfowl.

㉞ Page 2-102, Table 2.1.2.9-3. Minot to East Grand Forks, North Dakota is listed as an area of special concern because this segment contains numerous prairie potholes. Williston to Minot was excluded; however, this segment also contains numerous potholes and should be included as an area of special concern.

The bird pictured on this page is a sharptail grouse, not a sage grouse.

㉟ Page 2-135, column 2, par. 4. Bottom fishing is a high interest activity in Hood Canal, Washington. Herring and smelt fishing is also important.

㊱ Page 2-138, column 1, par. 1. Bottom fishing in Narrows and Henderson Bay, Washington area is excellent and an important recreational activity. Raking herring is also important.

㊲ Page 2-138, column 2, par. 5 and 6. We could find no reference to the asterisks. They should be footnoted if relevant.

㊳ Page 2-155, column 1, par. 2 and 3. Include raft culture of oysters, and pen rearing of salmon in this category.

㊴ Page 2-155, column 1 - 2.2.1.9. This statement is not completely valid. Because of threatened species classification, eagles can be protected under State and Federal laws from routine types of developments. See page 2-26 comments.

㊵ Page 2-161 - 2.2.2.7, Marine, Biological Components. Change wording to "Mariculture is a means of augmenting these resources." Pen rearing of salmon and rack culture of oysters are also important mariculture programs in Hood Canal, Washington.

㊶ Page 3-3, column 2, par. 1. Screening will be required in any water pumping project and should be addressed anytime water withdrawals are discussed.

㊷ Page 3-11, column 1, par. 3. Excavation of the launchway could modify the natural sediment drift and severely impact or even destroy Dungeness Spit, Washington. Our USGS contacts disagree with conclusions of NTPC contracted study.

㊸ Page 3-11, column 1, par. 3. The 140 acres only includes Phase I. Discussions should include Phase II.

㊹ Page 3-11 and 12, Excavation of launchway ramp, etc. In other sections of the statement the instability of the slope is addressed. The map addendum also identifies this as an unstable area, yet there is no discussion of the impacts of slumping on natural sediment drift and Dungeness Spit, Washington.

㊺ Page 3-13, column 1, par. 3. There is no discussion of where these 680 to 1,540 tons of soil will go. The statement about erosion on the coastal bluff needs to be more adequately documented.

㊻ Page 3-13, column 1, par. 4. There is no discussion on how oil spills and fluid leaks will be prevented from entering ground water.

㊼ Page 3-14, column 1, par. 4. The statement does not discuss the runoff area or what impacts those increased flows would have on natural salmonid activities if the runoff area were Seibert Creek, Washington.

Page 3-14, column 1, par. 6. We are concerned with this level of water withdrawals on fish needs. National Marine Fisheries Service and Washington Department of Fisheries screening and ft. lbs. of pressure requirements may prevent such large withdrawals. There is no discussion of how water is to be pumped from Dungeness River, Washington to the tank storage site.

㊽ Page 3-14, column 2, par. 1. The bacteriacide to be used is not identified. Data to support water quality dilution needs of 5 to 1 should be included.

㊾ Page 3-15, par. 3. Herring and smelt resources should be included.

㊿ Page 3-15, par. 4. Port Angeles Harbor, Washington is a wintering area for sea ducks and other water birds. Frequent spills could cause bird oiling which would stress birds and increase the rate of mortality.

(51) Page 3-15, par. 6. Earlier discussion mentioned toxic materials in sediments. They are not mentioned in this discussion. Washington State Department of Natural Resources and Environmental Protection Agency have standards for water disposal of dredge spoils which will have to be met. The statement does not discuss sediment drift.

(52) Page 3-16, column 1, par. 2. We are concerned about possible chemical contamination of clambeds, and the beaches of Dungeness Spit, Washington. Dredging may have to be coordinated with tides to reduce impacts.

(53) Page 3-25, column 2, par. 3. Tar balls also float to the surface. These floating balls attract birds which become coated and usually die. Oil that becomes impregnated with salts is nearly impossible to clean from birds.

(54) Page 3-25, column 2, par. 5. We are unsure what this statement means and feel it should be clarified. The 87,000 barrel figure does not correlate with calculated possible oil spills in Puget Sound, Washington. The statement alone is not an impact, it should identify fish kills, bird oiling, etc. that can be expected.

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(55) Page 3-28, column 2, par. 2. Oil spills, especially small quantities over long periods could displace food fish which would disperse birds from areas that are traditionally protected shelter areas. If birds are forced into open, exposed waters during storms they can become stressed and their chances for survival are reduced.

(56) Page 2-28, column 2, par. 3. Chances for food poisoning of humans would seem to be minimal. Impacts should be in order of importance.

(57) Page 3-29, Table 3.1.7-6. Under BENTHIC COMMUNITIES you should include the Hood Canal oyster seed stock. Under the FISH section, impacts would be major to intertidal breeders such as smelt and herring.

(58) Page 3-30, Photograph. Gulls are not classified as waterfowl.

(59) Page 3-32, column 2, par. 1, Birds. Floating islands of oil attract small fish, which are the food staple of most marine birds. The birds go under the oil mat to feed, then break water through the mats and get oiled. Your other statements are also correct.

(60) Page 3-33, Table 3.1.7-9 We have the following comments on this table:

1. Animal or Plant Group: This needs to be expanded to cover benthos and phytoplankton, detritus and other organisms at the bottom of the food chain.

2. Salt Marsh: This is one of the most important habitats to anadromous fish. Recent studies show juveniles feed in marshes during high tide and that marshes may contribute 80+ percent of their food.

   Crustaceans, Fishes-Bottom, Fishes-Open water, invertebrates other than those identified, benthos and detritus would all need and use salt marshes. Mechanical impacts to birds could be severe since birds use marsh areas for protection as well as feeding. Studies have shown that oil stays in salt marshes for long periods.

3. Eelgrass Beds - Fishes-Open Water: Herring spawning is very important. Oiling during spawning would have significant impacts.

4. Sand - Mollusks: Razor clams are a very important resource with a low resistance to oiling.

5. Mud - Mollusks: Commercial oyster operations in Hood Canal, Washington could be destroyed by oil spills in the streams of the Olympic Mountains. If oil penetrates and is retained in the mud the area is lost for as many seasons as it takes the mud to clear.

(61) Page 3-34, column 2, 3.1.8 Summary. An amortized economic loss to resources, considering a 100-year impact or even a perpetuity impact, should be compared against the positive benefits over a 20-year life.

(62) Page 3-35, 3.1.9 Terrestrial Wildlife. Coverage of resources is inadequate throughout the statement. There is more to wildlife than endangered species. Also there are some important managed species in a diminishing habitat. This type of coverage implies a low wildlife value in this area.

(63) Page 3-35, par. 1. You refer to "more suitable areas." If a habitat is suitable it will already be occupied. Somewhere along the line crowding and displacement will occur. Unless you want to demonstrate this sequential bumping or pecking order displacement for the peninsula, you should drop this concept and identify displacement losses.

(64) Page 3-35, Construction Phase. There is no discussion of possible summer use by bald eagles. We have a serious concern that disruption of the eagle nesting territory which is necessary for hunting, perching, flight training of young, etc. would cause the eagles to abandon the nest site. This needs to be investigated and discussed. There is no discussion of other wildlife species. This area is a rich and valuable forested environment.

Page 3-35, column 2, Operation and Abandonment Phases. See Construction Phase comments.

(65) Page 3-40, par. 5. Statement implies that industrial development would not set precedent for rezoning and increased industrialization. It will not be desirable to build ocean view homes adjacent to oil tanks and industry so the land will lose residential value. Secondary impacts should be evaluated and discussed.

(66) Page 3-41, column 1, par. 3. We are concerned with impacts of oil mixing with wood chips and other log boom related waste products. Will it allow oil to accumulate into oil balls more rapidly and sink or will it create floating mats of oil? The combination in this area could have significant impacts on resources. An investigation and discussion of these probabilities should be presented.

(67) Page 3-47, 3.1.14 Recreation. The impacts section on recreation is insufficient. Impacts are general, have no economic evaluation, and certain types of impacts are completely omitted from the statement.

(68) Page 3-48, column 1, par. 3, Green Point. If impacts are transmitted to Dungeness Spit there will be significant impacts.

(69) Page 3-48, column 1, par. 4, Operation Phase. We would like to see a worst-case impact figured in 1978-79 dollars. The statement does not discuss what the impacts a 50-100 barrel, undetected leak would have if it lasted 1 day or 1 week. It also does not state how much oil would be spilled before such a leak was detected and repaired. These general statements are meaningless.

(70) Page 3-50, column 2, par. 4. The statement implies that fish are in the Straits in equal numbers all the time. This is not a correct assumption. In Puget Sound, Washington the Fraser River run is extremely important but shortlived. If fishermen miss it they have lost much of their seasonal take. This is a very complex topic and it should be expanded and explained. Also, a worst case impact should be evaluated in 1978-79 dollars.

Page 3-50, column 2, par. 5. Assessment of losses must be presented in the final EIS.

(71) Page 3-51, column 1, par. 3. Based on these figures calculate the estimated cost of each of the project spills identified on the trajectory maps in the risk analysis section. Also, estimated clean up costs of a 50-100 barrel undetected accident and a 10,000 barrel major accident in Port Angeles Harbor, Washington should be identified. Describe the clean up activities in detail. Discuss material removal, sterilization, oil removal, etc. Identify mitigation to replace clam beaches and other resource areas if they will receive secondary impacts for clean up.

(72) Page 3-51, column 1, par. 5. This section is not clear and it should be indicated whether fishermen who lose revenue because they could not fish during an accident will be allowed to claim those losses. If not, it should be identified how they will be reimbursed.

(73) Page 3-60, column 2, par. 2. There is no discussion of loss of biological environment to slides. When slides block a stream or creates extensive sedimentation in a stream the impacts will be significant. Mitigation measures will have to be established to replace possible fish and wildlife losses from such an accident.

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74 Page 3-61, column 2, par. 3 and 4. This statement is not consistent with previous statements about seismic and geologic hazards along the corridor. Spring freshets frequently have velocities of small outbursts along certain western Washington streams. The Dungeness River, for one, has serious erosion problems and could create problems. Alternative methods or locations for crossing such streams should be suggested and evaluated.

75 Page 3-63, par. 1. Since this topsoil is coming from a point source and contributing to degradation of stream quality it could fall under the NPDES guidelines for point source discharges. This should be investigated and discussed.

76 Page 3-66, column 1, par. 1. Data relative to benthos and detritus production from marshes and other wetland habitats and the effect oil will have on their production, as well as what impacts oil could have on fish resources should be included.

77 Page 3-67, 3.2.6, AQUATIC RESOURCES. In the event of an oil spill, are chemicals expected to be used in the clean up? If so, what chemicals would be used and what would the resultant environmental impacts be? The EIS also recognizes the possible reduction of aquatic insect populations downstream from the crossing site, however, the species and diversity of aquatic insects involved should be identified in order to present the impacts.

78 Page 3-67, column 1, par. 4. Flushing qualities depend on the time of year material is deposited, type of material deposited and physical characteristics of a stream. Also, preconstruction quality of biological values is different than for water clearness.

79 Page 3-67, column 2, par. 2. The discharge of hydrostatic test water into the St. Joe River, Idaho, during the low flow period could cause severe impacts to aquatic resources in the stream and in the St. Joe arm of Coeur d'Alene Lake. The low flow period usually occurs during the months of August through October. If construction occurs during this period, the test water should be discharged to a holding pond and treated before it is released to the river. There should also be a discussion of the chemical composition of the water at flush, and disposal of lunch pails, trash, etc. that always wind up in pipelines.

80 National Marine Fisheries Service and Washington Department of Fisheries have screening and maximum flow pressures that could affect the proposed 6 cfs withdrawal. This should be considered and discussed.

81 If short-term impacts occur at the right time it could eliminate a pink salmon run since they have a 2-year cycle.

82 This entire statement is a discussion of actions but never really discusses impacts. Display a worst-case profile showing temperature elevations, pH, soda, and bactericide into a low volume stream on the west side of Hood Canal, Washington where there are multiple salmonid species.

83 Page 3-67, Operation Phase. The statement is made in the EIS that a potential oil spill of 3,540 to 4,660 barrels (e.g. 256,000 plus gallons per day) could be discharged per day until visually detected and stopped. A discharge of this magnitude would be a major disaster for fish and wildlife and their habitats. The Council on Environmental Quality, in their National Oil and Hazardous Substances Pollution Contingency Plan in the February 10, 1975, Federal Register (40 FR 6282 - 6302) lists a major discharge as being more than 10,000 gallons. Since the potential for a major spill from the proposed pipeline would far exceed CEQ criteria, the EIS should more fully disclose the potential impacts of such a spill.

84 Page 3-68, Table 3.2.6-1. This table displays an action, not impacts. It should identify; (1) length of time the sediment will impact each stream, (2) the distance the sediment will drift, (3) the estimated deposit depth from the initial action to the point of zero deposit, (4) the volume and velocity of water needed to scour these sediments, and (5) the frequency of these needed flows.

85 Page 3-72, column 1, Biological Components. This section should include a discussion of possible effects of disruption of chemically contaminated sediments during construction. In Minnesota and North Dakota, for example, the Red River of the North has a potentially serious problem with mercury and PCB contamination of sediments. The Minnesota Pollution Control Agency will soon have available the results of recent chemical monitoring of the river.

86 Page 3-72, column 2, par. 6. This statement implies an action that cannot occur. Compliance with screening criteria will insure that fish will not enter the pipe. Under these criteria if fish start entering the pipe, pumping will be shut down.

87 Page 3-73, Table 3.2.6-3. Impacts of pipeline rupture would be high in salmon streams on the west side of Hood Canal because of the spawning and rearing activities in the streams and the close proximity of the pipeline crossing to the mouths of the rivers which empty into Hood Canal.

88 Page 3-74, Table 3.2.6-4. Discussion of downstream shellfish resources and fish rearing habitats should be included.

89 Page 3-75, column 1, par. 3. This statement seems to contradict itself. Somewhere along the line a stream reaches a maximum sediment load. If a stream is carrying a high load its point of saturation will be reached sooner than the same size stream with a low sediment load. This needs clarification.

90 Page 3-75, par. 4. In streams where the sediment source is near the mouth the impacts will reach beyond the stream, i.e. west side of Hood Canal streams, and induce other types of impacts.

91 Page 3-75, column 2, par. 4. Add tideflats to settling or deposit areas.

92 Page 3-75, column 2, par. 5. Pink salmon would probably not recover.

93 Page 3-78, column 2, par. 2. This statement is very general and assumes monotypic conditions on all sections of all streams and that stream levels are the same year-round. Be more specific and include effects of oil reaching downstream shellfish resources in Washington.

94 Page 3-79, 3.2.7 Marine Resources - Physical Components. Depending on the timing, impacts could range from low to significant. Will sediment deposits occur on downstream shellfish beds on streams where crossings are close to the mouths of the rivers? If so what will be the impacts? We would have the same comments on the Biological Components.

95 Page 3-80, column 1, par. 2. The actual concentrations of soluble factions, and what constitutes sublethal should be addressed. Levels of contamination of oyster and clam resources should be related to commercial ventures. Also, there is no discussion of smelt spawning areas.

96 Page 3-80, Abandonment Phase. There is no discussion of residue deposits from clearing and cleaning pipes.

97 Page 3-84, column 1, par. 2 and 3. This is a far reaching statement. We believe a worst-case scenario is appropriate for wetlands, tideflats, and possibly other critical habitats that may be identified by other reviewers.

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98 Page 3-84, column 1, par. 4. If the pipeline right-of-way is not inventoried for endangered and threatened plant species by a competent botanist prior to construction, the destruction of these species should be assumed. The resultant impacts should then be addressed.

99 Page 3-84, column 2, par. 1. The first sentence of this section indicates that "Assuming a worst-case situation, impacts from construction to bald eagles could cause abandonment of the four active nests. . . ." It must be recognized, and should be noted, that in actuality, the adverse effects on nesting bald eagles may be much greater than this since little effort has probably been expended to look for nesting eagles along the proposed route. This probability would also likely apply to other worst-case assumptions throughout this section of the report.

100 Page 3-84, column 2, Item 2). This item implies chemicals will be used to maintain the corridor. A discussion should be included showing a list of chemicals to be used and their impacts on surrounding vegetation and wildlife. This section should also include a discussion on impacts to wildlife in North Dakota as a result of partial destruction of limited habitats such as riparian woodlands, hardwood draws, shelterbelts, tree groves, native and tame grasslands.

101 Page 3-86, Construction Phase. Impacts from pipeline construction across streams could cause increased silt loads on riparian wetlands. These impacts should be discussed.

102 Page 3-90, Table 3.2.9-2. There are numerous other areas of concern in Washington. The mouths of all the rivers along the west side of Hood Canal support sea ducks and many are nesting sites for harlequin ducks.

103 Page 3-118, par. 1, sentence 2. This reads "Impacts could relate to the disrupted waterfowl production areas which might be drained." Is the applicant implying wetlands of Federally owned Waterfowl Production Areas might be drained? This should be clarified.

104 Page 4-1, Mitigating Measures. No mitigating measures of any value have been committed by the applicant. Numerous recommendations to minimize environmental impacts were presented to Bureau of Land Management by the Bismarck Fish and Wildlife Service office on February 28, 1978, and June 13, 1978. Did Bureau of Land Management approach the applicant on its willingness to make a commitment to such stipulations? If so, the reasons why the applicant will not make commitments to such recommendations should be given in this section of the EIS.

Page 4-2, 4.4 Topography and Geology. The map addendum identifies the face of Green Point Bluff, Washington as highly erodible. This is also a recognized necessity for the perpetuation of Dungeness Spit in Washington. The Fish and Wildlife Service will request a study by USGS, funded by NTPC, to evaluate the contribution that sediment drift between Ediz Hook and Dungeness Spit has on the maintenance of the spit and what impacts the proposed action would have on this drift before we will approve the necessary permits for any of the pipeline.

Page 4-2, 4.6 Aquatic Resources. The following should be added to this section:

1. Screening of test water withdrawal systems should be added to #2. Screening should be required on ballast water intakes on ships, or any other water withdrawal structure throughout the system.
2. During construction and abandonment, discharge sediment traps should be required to prevent debris from entering rivers from pipe cleaning, storage tank cleaning, etc.
3. Require replacing of resources to State fish and game departments for direct losses as a result of the pipeline or an accident related to the pipeline, i.e. tanker accident.
4. Require bonding to cover losses of commercial ventures from oil pipe or accident related losses, i.e. losses of fisheries equipment (nets, etc.) or damage to boats or other equipment.
5. Require bonding to pay for loss of a commercial product, i.e. contamination of oyster beds, etc., and identifiable losses of fish revenue from inability to fish specific runs because of oil pollution.
6. Rerouting sections of the pipeline along the west side of Hood Canal, Washington or any other area to reduce impacts to crossing any given stream.
7. Altering the means of crossing a stream from an underground crossing to a protected bridged crossing on streams with steep gradients.
8. Using the base system identified for highways to get pipes under streams.
9. Take necessary precautions to prevent herbicides from entering waterways. If possible, employ mechanical methods to control vegetation adjacent to stream crossings.
10. Maintain "instream flows" during the construction associated with any stream crossing.
11. Coordinate all stream crossings with Federal and State agencies responsible for the well being of aquatic resources.

Page 4-3, 4.9 Wildlife, par. 1. The first sentence is a contradiction of numerous comments relative to the storage tank farm destroying critical habitat for the bald eagle which is a threatened species. There is also no suggested mitigation measures for possible damages to Dungeness Spit, Washington.

Page 4-4, 4.9 Wildlife, par. 2. In presentation of biological data the Fish and Wildlife Service indicated that Green Point, Washington was an unacceptable site for a storage tank facility because of the nature and severity of the anticipated losses that could not be mitigated.

Page 4-4, 4.9 Wildlife, par. 3. We recommend consideration be given to the following additional measures to reduce possible adverse impacts on wildlife.

1. If practical, spot treatments with herbicides be used where herbicide application is necessary.
2. Stabilization, restoration, and revegetation of disturbed areas be performed as soon after construction as possible, giving priority to unstable and highly erodible areas.
3. Having a qualified wildlife biologist(s) field review the entire pipeline alignment immediately prior to or during construction. If necessary, delay construction in an area to prohibit interference with any endangered or threatened species or other important wildlife reproductive area or activity. If possible, bypass such areas.
4. Clearing boundaries and disposal areas should be identified in advance and located so as to minimize adverse effects on wildlife. Close coordination with responsible Federal and State management agencies would be essential to achieve this objective.

CONT

105 Page 5-3, column 1, par. 1. Noise would also affect eagles and other wildlife species. The lack of identification of noise impacts to fish and wildlife resources implies no impacts. This is not realistic.

106 Page 5-3, 5.1.4 Topography/Geology. We challenged statements made in 3.1.4. about the impacts along the face of Green Point, Washington and other areas. This concern should be related in this section.

107 Page 5-3, 5.1.5 Soils. There is no discussion of soil loss on the bluff at Green Point, Washington.

108 Page 5-4, Table 5.1.4-1. This table does not indicate loss of wildlife and fish and shellfish habitats and subsequent wildlife and fisheries losses to slides, etc. discussed under construction. Also, there is no discussion of the effect a major slide would have on the natural erosion cycle of the bluff or what effect tidal washing of excessive amounts of materials would have on Dungeness Spit, Washington.

109 Page 5-5, 5.1.6 Aquatic Resources: There is no discussion of possible impacts on the shoreline from installing the pipeline and the trough on the bluff at Green Point.

110 Page 5-5, column 1, Construction Phase, par. 1. The impacts of the reduction of a base flow of 0.5 percent on fish activities throughout the year should be discussed.

111 Page 5-5, column 1, Construction Phase, par. 2. The impacts of siltation in Seibert Creek, Washington on fish, the maximum level turbidity factors will reach, and the effects on $O_2$ levels needs to be addressed. Earlier discussions involved dumping of excessive amounts of water used for testing tanks, etc. into Seibert Creek. What impacts would this have on fish resources at different times of the year? This is a statement and not a identification of impacts.

112 Page 5-5, 5.1.7 MARINE RESOURCES and BIOLOGICAL COMPONENTS. The Marine Resources - Construction Phase identifies numerous sediments, nutrients, solubles, etc. and relates how these could reduce oxygen levels, and increase chemical and biochemical contamination of sea water. The BIOLOGICAL COMPONENTS section fails to discuss mortalities due to the oxygen failure addressed in the Physical Components. The impacts are generalized and somewhat abstractional. The document never says what may really happen in numbers of fish that could be lost if conditions were right or loss of revenue if the chemical buildup in fish did occur. We would like to see a worse-case scenario.

Also, if the sediment was washed onto beaches or shellfish areas what would the impacts be? We are concerned that strong odors would affect recreationists in the immediate area.

113 Page 5-7, 5.1.9 Terrestrial Wildlife. Eagles may be the most important concern, but they are not the only concern and the fish and game departments of the States involved should be contacted for a list of species they consider important and the impacts to these other important wildlife species should be addressed. Disturbance of eagle roosting and feeding sites which may force them to abandon these sites could conceivably force them to evacuate the entire area. This could cause abandonment of a nearby eagle nest.

114 Page 5-10, Table 5.1.14-1. Discuss impacts from each of the scenarios presented in the risk analysis cost in terms of days/use and dollars in revenue lost.

115 Page 5-13, 5.2.3 Noise. There is no discussion about construction noise impacts on fish and wildlife. Depending on timing and location, the noise level could have significant impacts on nesting, rearing, or wintering to numerous species. This aspect has numerous ramifications and should be expanded.

116 Page 5-15, 5.2.6, Physical Components, par. 2. Pumps used for withdrawal of hydrostatic test water should be screened to prevent the loss of small fish. If fry are in the pumping area, screen mesh size should not be more than 0.14 inch and approach velocity of water to the screen not more than 0.5 feet per second (fps). Specifications for screening of fingerlings are screen openings not more than 3/8 inch, and approach velocity not more than 1.0 fps.

117 Page 5-16, Biological Components, par. 2. The reduction of resident trout and warmwater fish populations in a stream and lake system such as the St. Joe River and Coeur d'Alene Lake, Idaho should be included as an unavoidable adverse impact of an oil spill.

118 Page 5-17, Forestland. The value of woodland habitats in North Dakota is very great due to its scarcity. Therefore, partial destruction of this habitat type would be a major not a minor adverse impact.

119 Page 5-18, 5.2.9, Terrestrial Wildlife, par. 2. Again, the unavoidable impact of wetland drainage is not mentioned. If proper mitigating measures are employed, wetland drainage can be eliminated or kept to a minimum. Any unavoidable wetland losses should be compensated for by restoration of an equal acreage of drained wetlands. This should be clearly pointed out in the final EIS.

120 Page 7-2, 7.2.1 Soils. Discussion of alteration of Green Point Bluff, Washington and possible alteration of Dungeness Spit needs to be included.

Page 7-2, 7.4.2. Irretrievable loss of bird life because of small chronic spills should be addressed. The discussion of bird use and potential impacts in Port Angeles Harbor, Washington are weak throughout the statement.

Page 7-4, 7.1.0.1 Recreation. A maintained corridor would increase public access to wildlife habitats, thus increasing pressure from general disturbance, i.e. ORV traffic, and by localizing hunting pressure.

121 Page 8-1, ALTERNATIVES TO THE PROPOSED ACTION. As stated in the general comments, the EIS addresses only major alternatives but fails to address numerous minor alternatives which could significantly reduce environmental impacts and still accomplish the purpose of the Northern Tier Pipeline.

122 Page 8-88, column 1, Terrestrial Wildlife. The EIS neglects to mention the presence of a nesting pair of bald eagles in the Pike Lake area, Clearwater County, Minnesota.

Page 8-97, Table 8.4.2.11-1. This table should be amended to include the nesting pair of bald eagles in the Pike Lake area.

123 Page 8-98, Port-Pipeline Systems. Two systems not discussed in the EIS are:

1. Transmountain Pipeline Co., port west of Port Angeles.
2. Foothills Pipe Lines proposal to build a pipeline from Skagway, Alaska to Edmonton, Canada then connect to the existing lines.

All combinations using the Transmountain line should be addressed.

Summary Comments

The Fish and Wildlife Service is concerned about the possible environmental impacts of this project. The Northern Tier Pipeline project EIS fails to adequately consider fish and wildlife resources. Numerous alternate construction methods which would minimize environmental impacts are not being considered. The company has made very few commitments on measures which would significantly mitigate losses to fish and wildlife resources.

W. J. Olds Jr.

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L-7

CITY OF KUPREANOF ALASKA

Post Office Box 50
Petersburg, Alaska 99833

March 31, 1979

Dear Sirs:

Kupreanof is a coastal community in Southeast Alaska. Living and working on the waters and beaches of Southeast we are concerned with maintaining the environmental quality we presently enjoy and economically depend on. It has come to our attention that a pipeline terminus and tanker terminal has been proposed for Skagway. More than the pipeline we oppose any proposals to bring oil via tanker up Chatham Straits and Lynn Canal or thru Icy Straits. The strength and size of the tides of Southeast Alaska would, in the event of a spill, spread oil throughout the Archepelago having devastating impact on marine and esturine life. Kupreanof lying on Wrangell Narrows could expect to be adversely affected.

We appreciate this opportunity to voice our disapproval and would appreciate your keeping us informed on future proposals.

Sincerely,

Harold Bergmann

Harold Bergmann
Chairman Planning and Zoning
Commission, Kupreanof

cc: Hammond
Gravel
Stevens
Young

L-8

CITY OF
Ephrata
WASHINGTON

April 3, 1979

OFFICIALS
LESLIE M. PARR — Mayor
[illegible] — Clerk

OFFICIALS
W. EDWARD ALLAN — Attorney
[illegible] — Treasurer

Bureau of Land Management
Room 1250 Lloyd Building
700 Northeast Multnomah
Portland, Oregon 97232

Re: Oil Transportation System as Proposed by
Northern Tier Pipeline Company

Gentlemen:

Enclosed please find Comment of City of Ephrata with regard to the above matter.

Very truly yours,

CITY OF EPHRATA

W. Edward Allan

W. Edward Allan
City Attorney

WEA:st
Enc.

COUNCILMEN
[illegible] [illegible] [illegible]
DICK MATHENY GLENN CHAMBERLAIN LOREN DIXON

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CITY OF
Ephrata
WASHINGTON

April 2, 1979

OFFICIALS
LESLIE M. PARR — Mayor
[illegible] — Clerk

OFFICIALS
W. EDWARD ALLAN — Attorney
[illegible] — Treasurer

COMMENT OF CITY OF EPHRATA, WASHINGTON,
ON DRAFT ENVIRONMENTAL STATEMENT ON CRUDE
OIL TRANSPORTATION SYSTEM AS PROPOSED BY
NORTHERN TIER PIPELINE COMPANY

Introduction:

The City of Ephrata is a third class municipality of the State of Washington with a population of approximately 5,500 persons. It is the county seat of Grant County, Washington, and the headquarters of both the U. S. Bureau of Reclamation, Columbia Basin Project and the Grant County Public Utility District are located in the corporate limits. We appreciate the importance of the completion of the proposed project not only to the citizens of the recipient states, but also the importance to our national well being and security. Depending on the exact location of the proposed pipeline, the City's Oasis Park, the Sewage Treatment Plant and/or the sanitary landfill may be adversely affected by the pipeline . It is with these concerns in mind that the following comments are submitted.

COUNCILMEN
[illegible] [illegible] [illegible]
DICK MATHENY GLENN CHAMBERLAIN LOREN DIXON

CONT

Adequacy of the Environmental Statement

The Draft Environmental Statement is inadequate in one major respect. It discusses a two mile wide corridor in which the pipeline can be located at any point. As the City understands it, the construction right of way for the pipeline is to be 90' and the finished permanent right-of-way is to be 75'. Because of the wide latitude of locations within the two mile corridor, there simply is no way in which the City can adequately assess the environmental impact.

If the pipeline is located along the centerline of the corridor, then the City's Oasis Park, including its water courses will be involved. If it is moved just a few feet either north or south, the City's Sewage Treatment plant and Disposal System, including two lagoons will be affected, or the sanitary land fill, which is owned by the City and operated by Grant County for the use and benefit of the citizens of the City and surrounding areas, will be affected. Obviously the environmental impact in either of the last two cases will be much different from the centerline plan. We believe that in order to be adequate, and to meet legal requirements, that the exact route should be stated in order to allow the City to adequately assess the specific environmental concerns. The City should not have to anticipate all possible alternatives and address them, nor should it be required to guess as to the exact location and try to assess the impact. For additional information on the area and possible problems involved, your attention is directed to pages 26-31 of the Northern Tier Pipeline Energy Impact Analysis Notebook for Grant County.

Another facet of the basic inadequacy of not stating the exact location is also discussed on page 51 of the aforesaid county notebook and it is important enough to require emphasis. It appears that the actual route within the corridor will not be chosen until after licensing by the Washington State Energy Facility Site Evaluation Council.

It appears to the City that in order for the E.F.S.E.C. to intelligently decide whether the license for the pipeline should be granted, that it must have full and complete information on all environmental impacts. If the exact location is not known prior to the decision, no such informed decision can be made, and the persons specially affected by the final location, such as the City of Ephrata, are left without adequate redress or remedy, short of the court system, to minimize or solve special and unique impacts. We again suggest that the exact location be designated or that the entire route be moved far enough to the south to entirely avoid the facilities within the City's concern.

The City appreciates the fine work of the staff of the Bureau of Land Management in preparing the Statement on a project of such magnitude and complexity. We also appreciate the opportunity to express our concerns and trust that adjustments will be made to enable us to adequately assess the full impact of this proposal.

Respectfully submitted,

THE CITY OF EPHRATA

By, Leslie M. Parr
Leslie M. Parr, Mayor

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L-9

W. Edward Allan
P. O. Box 968
Ephrata, Washington 98823
Telephone [illegible]

April 3, 1979

Bureau of Land Management
Room 1250 Lloyd Building
700 Northeast Multnomah
Portland, Oregon 97232

Re: Oil Transportation System as Proposed by
Northern Tier Pipeline Company

Gentlemen:

Enclosed please find Comment of Landowner W. Edward Allan with regard to the above matter.

Very truly yours,

W. Edward Allan

W. Edward Allan

WEA:st

Enc.

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W. Edward Allan
P. O. Box 968
Ephrata, Washington 98823
Telephone [illegible]

April 2, 1979

COMMENT OF LANDOWNER W. EDWARD ALLAN
ON DRAFT ENVIRONMENTAL STATEMENT ON
CRUDE OIL TRANSPORTATION SYSTEM AS
PROPOSED BY NORTHERN TIER PIPELINE COMPANY

Introduction:

The undersigned is the owner of a portion of Farm Unit 8 in Block 73 of the Columbia Basin Project. The subject land fronts on Martin Road approximately 3 miles south of Ephrata, Washington. It appears from the proposal that the centerline of the pipeline will bisect the subject land and therefore owner has a direct concern of the project. The land was purchased approximately two years ago and a permanent dwelling has been constructed thereon. Plans are now underway to improve the existing irrigation system and to plant a cherry orchard on approximately ten acres. The proposed pipeline would cut through the center of the proposed orchard. For a more detailed description of the area and potential problems, see Pages 18-20 of the Northern Tier Pipeline Energy Impact Analysis Notebook for Grant County. The undersigned is also the City Attorney for the City of Ephrata and engaged in the private practice of law. The subject premises are located approximately one mile west of the City's Oasis Park and the proposed West Canal crossing.

Adequacy of Environmental Statement:

The Draft Environmental Statement is inadequate in the following respects:

1. The exact location of the pipeline is not shown and thus specific impacts are not discussed.

   (Please refer to the City of Ephrata's Comments in this regard and insofar as applicable such comments are incorporated herein.) It appears, but is no where stated that the centerline of the pipeline is to follow the existing Grant County Public Utility District's electrical transmission line easement across the subject premises and land adjoining both east and west. If this is the case, the Statement is grossly inadequate in that it totally ignores the fact that the area involved has been subdivided into 5 and 10 acre tracts. There are, within 700 - 800' of the centerline and within a 1/3 mile length, six domestic wells serving ten (10) families all of which would certainly be adversly affected in the event of a spill. In one case, the centerline would be within 100-150 ' of the back door of an occupied dwelling and within less than 50' of a domestic well. No assessment is given as to the length of time a domestic well would be unusable should there be a slow underground leak which would permeate the sub-strata and pollute the water supply, or even from an outright spill which would contaminate a well.

2. In those areas where the pipeline is to follow the electrical transmission line the danger of a fire caused by an oil spill and electrical short is not addressed.

   The draft statement indicates that for several miles along the Beezley Hills area the pipeline is to follow the P.U.D. right of way. It takes little or no stretch of the imagination to anticipate that an oil spill could undermine one of the transmission line towers, causing it to drop the transmission line into the spill and bring about an electrical short and resulting fire. No consideration is given in the statement to this danger or to the impact if such did occur.

3. The statement is inadequate in that it does not indicate whether there will be a joint use of the existing P.U.D. right of way or merely follow it to one side.

   Obviously, the impact is minimized if the proposal is for the joint use of the right of way. Table 1.3-1 on page 1-5 of the statement indicates joint use of B.P.A. rights-of-way. (The P.U.D. right of way on the subject premises was formerly owned by the B.P.A.) However, the easement which was granted to the B.P.A. on the subject premises is specifically limited to "one or more electrical transmission lines." This joint use without the underlying fee owner's consent is not possible.

4. Lastly, the statement is inadequate in that while it states that "large trees" will not be allowed on the finished right-of-way, it does not define a "large tree" or indicate if orchards will be allowed.

   For example, is a dwarf cherry tree or apple tree prohibited at the outset or only after it reaches a certain size? If they are prohibited the impact of the loss of land which is ideal for orchard production is not assessed. If they will be allowed it should so state.

While we realize that this comment is to be limited to inadequacies in the draft statement, we cannot help but comment that if the entire pipeline were moved approximately one-half to one mile south in the area of the subject premises that all or most of the concerns raised in both this comment and in the City of Ephrata's would be avoided, with very little adverse impact in the other area.

As a taxpayer, I appreciate the good work that the B.L.M. staff has done on this complex task. This is one time when you really are supplying a vital service to the citizens. Keep up the good work! Thank you for this opportunity to be heard and for your consideration.

Respectfully submitted,

W. Edward Allan
Rt. #1 - 529 Martin Rd.
Ephrata, Washington 98823

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L-10

THE TULALIP TRIBES
6700 TOTEM BEACH ROAD
MARYSVILLE, WASHINGTON 98270

March 30, 1979

TO: Northern Tier Coordinator
Portland ES Field Office
729 N.E. Oregon St.
Portland, Oregon 97208

SUBJECT: Draft EIS Crude Oil Transportation System

In light of the recent change in the preferred routing of the NTPC Pipeline from an around-the-sound to an under-sound route, it is unclear what value comments concerning the draft EIS have. I am including comments regarding both proposals although detailed comments on an under-sound pipeline will not be possible until the proposal is presented in detail.

SPECIFIC COMMENTS:

Pg. 1-1 Column 1 Paragraph 5: It is unclear what is implied by a 2 mile wide corridor. Would this give NTPC a right to pre-empt other uses in this corridor?

Pg. 1-4 Column 1 Paragrapg 3: Will the Northern Tier States be able to absorb the influx of ANS crude if sweet crude input is limited, as you state it is on the West coast?

Pg. 1-7 Table 1.4-2: During ultimate maximum capacity operation, the table indicates better than one tanker/day would have to visit the off-loading facilities in order to supply the 933,000 bpd. The tables also indicate much of this oil will be from foreign sources. If there sources are restricted will the project still be feasable. This question relates back to the previous question.

Pg. 1-10 Column 2 Paragraph 3: What degree of purity would the oil-water separators acheive? What would be average or expected volumes of discharge?

Pg. 1-11 Column 1 Paragrapg 2: The location of these booms needs to be included in figure 1.4-2. What would the capacity of this boom system be? How long would it take to encircle the area?

Pg. 1-11 Column 1 Paragraph 5: Where would the Clean Sound Cooperati
Services be located? How long would it take to deploy the services.

**L-10 CONT**

equipment, and expertise of the Clean Sound Cooperative? Can these services handle multiple spills?

Pg. 1-11 Column 2 Paragraph 2: It seems that this system may not be able to adequately detect slow leaks. How long a period each day would the pipeline be in inactive condition with the 1 plus deliveries/day planned?

Pg. 1-11 Column 2 Paragraph 3: Does a measurement accuracy of .5% of the pipeline capacity refer to volume capacity or flow capacity? If a volume capacity is used, a leak of 357 barrels or less could go undetected. If the measurement refers to flow, a spill of 500 bph or less would go undetected by the system.

Pg. 1-11 Column 2 Paragraph 4: What is the expected accuracy of the secondary system?

Pg. 1-14 Column 2 Paragraph 3: Will the soluble faction be removed? What degree of oil removed is expected by the seperators and what sort of "worst case" water quality could be discharged in Siebert Creek?

Pg. 1-21 Table 1.4-7: The list of "Major stream and river crossings" should include smaller tributary streams which are very important in regards to their fisheries value. These smaller streams could be much more severely effected by construction procedures and long term effect than longer rivers and streams. They also are very important to downstream water and gravel quality.

Pg. 1-46 Column 1 Paragraph 1: Alternative methods of streambed excavation or crossings must be considered. If drainage ditches warrant boring under, this should be considered for stream crossings also. The method proposed could cause excessive siltation of downstream areas as well as possible streambank erosion problems. Do you intend to comply with state water standards regarding turbidity?

Pg. 1-46 Paragraph 7: What length of time would you expect to be actually in the streambed from start of excavation to back-filling?

Pg. 2-22 Paragraph 4: Eagles cannot be accurately described as a terrestrial species as they are heavily dependent on marine and fresh water fish as a good supply.

Pg. 2-79 Paragraph 5: This paragraph suggests that most small streams contain only forage fish. This is a misleading generality. Small streams are often very important as spawning& rearing areas and their importance should not be downgraded.

Pg. 2-80 Table 2.16-17: This table indicates that Siebert Creek has a high fisheries value. The impacts on this creek in terms of production and possible damage to this stream by sedimentation and discharge of treated runoff must be presented.

Pg. 2-96 Table 2.1.2.9-1: It is likely that Bald Eagles winter along the Green & Cedar Rivers also.

Pg. 3-8 Section 3.1.3: The impacts of increased noise levels, during all phases of operation & construction, on fish and wildlife need to be discussed.

Pg. 3-11 Column 1 Paragraph 7: Where will the large amounts of excavated materials from the launch-way ramp be disposed of?

Pg. 3-11 Column 2 Paragraph 3: Removed of pipeline during abandonment would cause renewed instability on the launch-way have on sediment transport along the Strait of Jaun De Fuca?

Pg. 3-14 Column 1 Paragraph 6: This water withdrawl could be critical at certain times of the year. The whole of section 3.1.6 deals with activities and does not give adequate consideration of the impacts of these activities i.e. - effects of withdrawing water from the Dungeness River, putting test water into Seibert Creek & Puget Sound, etc.

Pg. 3-29 Table 3.1.7-6: This table is totally misleading Data obtained after a major oil spill of France indicates that plankton is initially hit very hard due to direct contact and contact with soluble factions. Being the food source for rearing and adult salmon, andy widespread impact from a major or prolonged minor spill would affect fish populations in the area. During out-migration of salmonids the Puget Sound plankton is critical to ocean survival. The statement that benthic communities in Rocky interidal areas would receive minor impacts and would recover quickly is also incorrect. As a sheltered body of water, many rocky intertidal areas do not receive the heavy wave action as your state. It is my understanding that in past spills in undheltered areas cause does to 1 00% mortality of benthos in Rocky, intertidal areas and that years one required to restore these communities. The recovery period would be much longer for Puget Sound.

Pg. 3-72 Column 1 Paragraph 4: Having experience in River and stream stability problems, it is very likely that disturbance of moderate and steep streambanks could cause continued sedimentation problems. As most Puget Sound salmon stocks are presently in a depressed state, any reduction in spawning sucess or survival could cause severe problems with some stocks.

Pg. 3-72 Column 1 Paragraph 3: The statement that sediment would slightly reduce production of could eater fishes is meaningless without substantiation. The impacts could be from minor to severe. This is too generalized to have any value.

Pg. 3-72 Column 2 Paragraph 4: Fish would not merely be displaced as stated. Displacement to another area would increase competition and force fish into a possible less suitable area. Again your statement is misleading and too generalized to have any meaning.

Pg. 3-72 Column 2 Paragraph 5: It would seem logical to screen the intake.

Pg. 3-72 Column 2 Paragraph 6: The statement "there would be no significant impact resulting from test water discharge", must be explained or proved. Contaminants in the test water would have an impact on Siebert Creek.

Pg. 3-79 Column 2 Paragrapg 2: Sediment produced during construction will almost certainly effect estuarine areas on Hood Canal and South Puget Sound.

Pg. 3-84 Column 2 Paragraph 1: Disturbance of any known nesting areas would be unacceptable under the Endangered Species Act. Again, mere displacement is not a reasonable assumption. Loss of habitat is one of the main reasons Bald Eagles are depleted in numbers.

Pg. 5-6 Section 5.1.7: There is no mention of possible effects on salmonids using Siebert Creek, this must be discussed.

Pg. 5-6 Section 5.1.7: No mention is made on the possible effects of chronic or worst case oil spills on salmonids in particular. Outmigrating fish are heavily dependent on plankton as a food source. A major effect on Puget Sound salmon. Returning adults also rely on good water quality and a worst case spill could severly impact all Puget Sound stocks. This must be researched and discussed.

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We would like to offer the following comments:

1. Although the draft EIS is a handsome piece of work, it is much too general. Fisheries and wildlife value and impacts will have to be quantified before it will be possible to make realistic judgements on the enviromental effects of the proposed project.

2. Considering the value of Puget Sound Fisheries and Wildlife to industry, the tourism trade, and quality of life in the Puget Sound, some examples of the effects of actual major spills in other areas would be helpful in determining what impacts could be expected in Puget Sound if a major or minor spill occured. Effects on pelagic fish, shellfish, retention of heavy factions in sand and mud bottoms, and residual times in a sheltered body of water such as Puget Sound should be included. There are many other possible impacts which must be quantified to some extent before this document will be adequate.

3. No mention is made in any section regarding to possible impacts on the Indian people in Puget Sound area. As a culture which is uniquely dependent on the fish and shellfish of this region and which suffer from often below average incomes, the potential effects are especially critical. The draft EIS does not supply specific enough information to enable an educated conslusion to be drawn on the impacts of the proposal.

4. The impacts need to be drawn together in one section to minimize confusion.

5. Consideration needs to be given to all streams which are crossed, regardless of size. Many of these smaller streams are very important to salmonid spawning and rearing. In addition any sediment inputs in even the smallest stream will impact the entire downstream system. Not enough information is supplied on this type of impact.

6. The section describing consultation and Coordination is noticably lacking contacts with Northwest Indian groups. Considering the possible impacts on the Indian people of the Puget Sound area, this lack of consultation seems a serious breach of duty.

DS/vo

Dave Somers
Fish Biologist, Tulalip Tribes

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**L-11**

ffice Of The Mayor
City of Seattle
Charles Royer, Mayor

March 30, 1979

Bureau of Land Management
700 NE Multnomah Avenue
Suite 1250
Portland, Oregon 97230

Attention: Charles Hoyt

Dear Mr. Hoyt:

I appreciate the opportunity you have given the City of Seattle to extend comments on the Draft Environmental Statement Crude Oil Transportation System.

The Department of Community Development has the general responsibility for coordinating such comment activities for the City of Seattle. I am enclosing for you a copy of the response developed by the Department.

Sincerely,

Charles Royer

Charles Royer

CR/dhp

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Your
Seattle
Community Development

[illegible] Grothaus, Director
Charles Royer, Mayor

March 30, 1979

The Honorable Charles Royer
Mayor
City of Seattle

Dear Mayor Royer:

The Department has completed its review of the Draft Environmental Statement for the Crude Oil Transportation System which was prepared by the Bureau of Land Management. We found the document to provide a thorough discussion of the project. The comments presented below reflect the concerns of the City Light Department as well as our own.

The proposed pipeline will cross an electric transmission line right-of-way near the Cedar River in the vicinity of Landsburg (Alignment Sheet No. 2, Human Impacts in Map Addendum). We anticipate the alternative routes, which will arrive at North Bend, will also cross a transmission line right-of-way near Arlington. Assuming that the Northern Tier Pipeline Company will be required to make the appropriate application to the City of Seattle for permits or easements to cross our rights-of-way, we do not anticipate any procedural problems at this time.

In addition, since this department has the responsibility of coordinating the comments on environmental documents for the City of Seattle, we request that the SEPA Public Information Center be included in the distribution list for receipt of the Final Environmental Impact Statement and any subsequent documentation on this project. We also request that the Bureau of Land Management include the SEPA Public Information Center on its distribution lists for all future environmental documents involving projects within the jurisdiction of the City of Seattle.

If you have any questions concerning the comments contained in this letter, please do not hesitate to contact Larry Schmeiser, Director of the Department's Environmental Management Division.

Sincerely,

Darel E. Grothaus

Darel E. Grothaus
Director

DEG/DM/sp
cc: J. P. Bacchi, Acting Superintendent of City Light

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**L-13**

KENNETH C. PICKARD
ATTORNEY AT LAW
P. O. BOX [illegible]
COUPEVILLE, WASHINGTON 98239
TELEPHONE [illegible]

April 4, 1979

Bureau of Land Management
Room 1250 Lloyd Bldg.
Portland, Oregon 97232

Re: Northern Tier Proposal to Cross Sound & Island Co.

To Whom It May Concern:

In my review of Northern Tier Draft Environmental Impact Statement, there has been a very insignificant amount thereof dedicated to addressing the ramifications, impact, and mitigating factors of the proposed Cross Sound, Whidbey Island and Camano Northern Tier project.

Also, it has been very difficult for members of the public in Island County to receive copies of said Draft E.I.S., or access thereto, and I would ask that you consider extending the time for comments to the E.I.S. in light of these difficulties.

Very truly yours,

Ken Pickard

KCP:cp

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**L-14**

SIERRA CLUB
LEGAL DEFENSE FUND

April 3, 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Re: Draft Environmental Statement, Crude Oil Transportation System (Northern Tier)

Dear Director:

This is in reference to the Summary, Draft Environmental Statement, Crude Oil Transportation System (as proposed by Northern Tier Pipeline Company), wherein several alternative methods of transporting oil from the West Coast to the Midwest and East Coast are discussed.

This office represents the Southeast Alaska Conservation Council, a coalition of eight conservation organizations in Southeast Alaska. During the last three years SEACC has developed a proposal for the conservation of thirty-nine areas of unusually high scenic, wildlife, recreational and wilderness values within the Tongass National Forest. One of the alternative routes considered within the above Draft Environmental Statement would involve marine transporation of oil to Skagway, Alaska, and would adversely impact several of these areas, including Admiralty Island, Endicott River, Yakutat Forelands, South Baranof Island and West Chicagof-Yakobi Island, in addition to Glacier Bay National Monument. These areas, all of which are proximate to the proposed shipping route, provide rich habitat for abundant numbers of waterfowl, fish, marine mammals and shellfish, all of which are very sensitive to oil pollution. Therefore, SEACC opposes this alternative.

The proposed shipping route is undoubtedly unsafe. These waters are frequently congested with seining, gillnetting and trolling operations. Whales, which are a hazard to navigation as well as vulnerable to oil pollution and collisions with marine vessels, frequent these waters. Severe storms which generate high winds and rough seas occur year round, and together with swift currents and tides as great as twenty feet, make navigation extremely hazardous in these narrow inside passages. The addition of large, difficult-to-maneuver tankers making daily trips to Skagway will inevitably lead to collisions and oil spills. For example, during summer months more than three hundred fishing boats, trailing long gill nets behind them, converge on the upper Lynn Canal area just south of Skagway for several weeks of frenetic salmon fishing. It is unlikely large tankers could negotiate this congested waterway safely for long.

Furthermore, development of Skagway as a major oil transportation center is not consistent with the National Park Service's recent major investment in a National Historical Park in that community. This is because the inevitable result of development of a large oil transfer facility in Skagway will be an increase in population and the introduction of such amenities as fast-food chains and strip developments, ruining the "frontier atmosphere" Skagway presently offers to the visitor.

SEACC is also concerned that a major oil spill could impair Southeast Alaska's two major industries, fishing and tourism, due to permanent loss of key salmon runs and scenic values. Prevailing currents would carry oil spills into Glacier Bay National Park, where, due to slow decomposition in its cold environment, the shorelines would be scarred with oil stains for many years.

Finally, it now appears that North Slope oil production will begin to decline in the early 1980's, possibly eliminating the need for a terrestrial route such as the Skagway pipeline. If that were to occur, then Southeast Alaska would have to deal with larger supertankers than currently anticipated, because additional tankers from the Far East would be required to keep sufficient oil flowing in the Skagway pipeline to pay for the project. This possible scenario should be addressed in detail in the Final Environmental Impact Statement. Similarly, the Final Statement should compare the energy requirements of the various alternative routes; it seems foolish to pump North Slope oil over the mountains to the sea, only to pump it back over the mountains into the interior, as the Skagway pipeline project proposes.

Thank you for providing this opportunity to comment.

Very truly yours,

Stephan C. Volker

Stephan C. Volker
Attorneys for Southeast Alaska Conservation Council

SCV/hs

cc: Alaska Department of Policy Development and Planning
National Marine Fisheries Service
National Park Service
U.S. Forest Service

L-15

Jefferson - Port Townsend Regional Council
c/o Jefferson County Planning Dept.
County Courthouse
Port Townsend, Wa. 98368
tel. (206) 385-1427

April 3, 1979

Bureau of Land Management
Northern Tier Project
Room 1240, Lloyd Building
700 Northeast Multnomah
Portland, Oregon 97232

Re: Comments to the Draft Environmental Impact Statement for the Northern Tier Pipeline Project

Dear Sir:

The Jefferson-Port Townsend Regional Council was erroneously informed that due to the announcement by Northern Tier Pipeline Company of a major change in the proposed project the B.L.M. draft E.I.S. would be supplemented, thereby extending the comment period until the supplement was released. The Regional Council was informed late yesterday that this is not the case and comments were due April 2, 1979. Conversations with the project staff at B.L.M. has assured us that our comments and concerns, although late, will be included in the final E.I.S.

In review of the draft E.I.S. of the Northern Tier Pipeline project, we are forwarding the following comments for inclusion in the final E.I.S. Please note, because the draft E.I.S. specifies the around-the-sound route as the proposed project, comments will be focused on that route.

### CHAPTER 1, PROPOSED ACTION

A. Minor Stream Crossing Table 1.4-8: Include Jefferson County with nine (9) minor crossings which are Snow, Salmon, Spencer, Marple, Jackson, Turner, McDonald, Fulton and Donovan Creeks.

B. Electrical Energy: Provide an analysis of pump station power requirements and energy demand on the Olympic Peninsula The analysis should include source and relationship to domestic demand.

C. Construction Materials Stockpile Locations: A description of the requirements of stockpile locations including size, security, access, etc.

D. Construction Material Requirements Table 1.4-17, Select Fill: Table should be updated to provide the estimated amount of cubic yards of fill required to install the pipeline in Washington State.

. Stream and River Crossings: In many instances in Jefferson County the crossing of streams and rivers by a submerged method is not practical or preferred due to terrain, soils, geologic conditions, effect of migratory fish species, down-stream sedimentation of critical habitats, etc. Discussion should be given to tresseling over streams and rivers including illustrations of design features.

The construction "window" or time frame in which any work along streams and rivers can be accomplished should coincide with the migratory habitats of fish. Each stream and river should be judged independently as different fish species use stream and rivers for fresh water life phase at different times of the year. (See figure 2.1.2.6-2, pages 2 through 83, draft E.I.S.) A blanket construction time during a three-month period as stated in the draft E.I.S. may be detrimental to fish species.

F. Water for Pipeline Testing: The withdrawal of water from streams and rivers for pipeline testing may be detrimental to migratory fish species. Discussion should be made on the amount of water required and source, including municipal supplies.

### CHAPTER 2, DESCRIPTION OF THE ENVIRONMENT

A. Marine Resources: (1) Discovery Bay - A description of Discovery Bay and the marine resources found there is absent from the draft E.I.S. The Washington State Department of Fisheries states that Discovery Bay is one of the top five commercial clam producing areas in the state. This and other physical attributes should be addressed. (2) Hood Canal, Dabob and Quilcene Bays - The draft E.I.S. omits discussion of Hood Canal, particulary Dabob and Quilcene Bays, as one of the only areas found in the world for the spawning and cultching of oysters.

B. Endangered and Threatened Species: Species found to have critical habitat areas in Jefferson County include Black Oyster Catcher, Tufted Puffin, Rhinoceros Auklet, Killer Whale, and Minke Whale. An endangered species found in the Strait of Juan de Fuca is the Humpback Whale.

C. Land Use Table 2.1.2.12-1: The table should include the communities of Quilcene and Brinnon under urban build-up category.

D. Socio-Economic Data Table 2.1.2.15-1, Housing: A recently completed housing study in Jefferson County indicates the vacancy rate for rental units is less than one percent. This vacancy rate will be further strained by the activation of the U.S. Navy facility at Indian Island in the summer of 1979.

### CHAPTER 3, ENVIRONMENTAL IMPACTS

A. Noise: A description of noise should include noise levels resulting from blasting near habited areas.

B. Physical Geology: A description of "borrow pits" where selected fill material is removed for backfill into the pipeline trench should be included, along with the estimated amount of fill material required.

C. Aquatic Resources: The description of anticipated impacts under the construction phase should include a discussion of increased stream bank erosion due to water diversion - blockage that will increase water velocity. Also, the diversion of water may expose downstream beds which are significant to migratory fish.

The discussion should be expanded to include impacts to estuarian waters at the mouth of streams and rivers where increased sedimentation will accumulate.

Water used in pipeline tests should only be drawn from streams or rivers where there is a sufficient flow that protects fish resources. Municipal water supplies should be a preferred alternative to diversion from streams and rivers.

Discharge of test waters into rivers and streams will create a number of adverse impacts including an increased rate of velocity of receiving waters, changes to the chemical make-up of waters, and introduction of chemicals. Significant impacts may occur to aquatic flora and fauna.

Table 3.2.6-1 should be updated to show estimated sediment increase to Snow, Salmon, Spencer, Jackson, Marple, Turner, McDonald, Fulton, and Donovan Creeks.

Oil spill impacts do not include impacts to estuaries and shorelines where oil will accumulate. As most of the rivers and streams crossed are short distances from receiving waters, a discussion of impacts on the receiving waters is required.

D. Biological Components, Summary: No discussion of impacts on estuaries or receiving marine waters. As Dabob and Quilcene Bays are critical habitat areas for oyster seeding and cultching in Hood Canal, the discussion should address the impacts of an oil spill on these resources.

E. Terrestrical Vegetation: Vegetation control will generally be undertaken by mechanical or herbicide use. Since the Jefferson County corridor is already under vegetative control, additional herbicide use would create an increase in the potential for off-site contamination due to erosion or leaching.

. Transportation and Utility Networks: Damage to County right-of-ways due to loads exceeding tolerances may result. New access roads will be required for construction and operation periods.

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CONT.

G. Recreation Resources Table 3.2.14: Housing accommodation limitations as well as summer construction schedules will create workforce demand for recreational campgrounds and facilities. Since this coincides with normal tourist season peak demand, recreational facilities will be severely impacted, as well as creating demand for other private developments. Oil spills affecting marine waters will also affect recreational qualities of those areas.

H. Social and Economic Conditions Discussion: It does not adequately address impacts on seasonal housing accommodations. Since the local labor force contains few union card holders, employment opportunities created by the Northern Tier workforce will not be readily filled by local residents. Limited work span within the County will generate little local expenditure by the workforce.

Specialized facilities, equipment and training in the areas of medical, police and fire protection are direct costs to those entities. These impacts are not adequately addressed. Fiscal impact from taxation is very general and draws conclusions with no justification. Existing pipeline examples exist throughout the County for comparision, yet nothing is exemplified. The assumed Northern Tier "right of eminent domain" is erroneous.

### CHAPTER 4, MITIGATING MEASURES

Noise: Restriction of work hours in and around residential areas.

B. Topography and Geology: Realignment of pipeline around geologically sensitvie areas (areas of poor slope stability, high compressibility, etc.).

. Aquatic Resources: (1) Tresseling of pipeline over streams and rivers. (2) Realignment of pipeline route. (3) Test water received from municipal sources. (4) Holding and settling ponds to receive test waters.

D. Marine Resources: Measures presented do not consider affects or prevention of oil spill associated with rupture at stream or river crossings, then transport to marine waters. (1) Tresseling of pipeline over streams and rivers. (2) Oil spill clean-up capabilities at major rivers.

E. Transportation/Utility Networks: (1) The development of a road access network for construction and maintenance of pipeline. (2) Construction, repairing or replacement of designated haul routes.

F. Social and Economic Conditions: (1) Pre-payment of taxes. (2) Training and special equipment purchase to local agencies engaged in emergency services. (3) An indeemnity fund to provide for costs associated with identified impacts resulting from the proposed project.

### CHAPTER 5, UNAVOIDABLE ADVERSE IMPACTS

A. Aquatic Resources: Hydrostatic test water source is directed at streams. This can be avoided through use of municipal water sources in Jefferson County.

### CHAPTER 6, SHORT TERM USES VERSUS LONG TERM PRODUCTIVITY

Port and Onshore Storage Facilities: Does not address the potential industries and commerce resulting from the proposed project. There is sufficient record nationally of such a potential and the results, which must be included as part of the impact of the Northern Tier proposal.

B. Cummulative Impacts: This section should address the long term productivity of the marine waters of the Strait of Juan de Fuca and Hood Canal compared to the anticipated productivity of an oil transhipment terminal and pipeline project.

### CHAPTER 8, ALTERNATIVES

This chapter should include sites that may be presently precluded by existing federal laws, but which may physically and environmentally be more suited for an oil transhipment site.

This chapter should provide a ranking of alternatives based on known environmental conditions and potential impacts, regardless of current project status.

Also provided for your use is Appendix A and Appendix B. Appendix A illustrates the proposed pipeline route as it passes through Jefferson County, illustrating areas as being environmentally hazardous or sensitive. Appendix B is an analysis of the streams and rivers crossed by the proposed project, illustrating resources found within them and recommended mitigative measures.

We thank you for the opportunity to review this draft Environmental Impact Statement and look forward to your review comments as they address our concerns.

Sincerely,

A.M. O'Meara

A.M. O'Meara, Chairman

cc: Jefferson County Board of Commissioners
William B. Howard, Jefferson County Prosecuting Attorney
James Williams, Washington State Association of Counties

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CONT.

APPENDIX A

## DESCRIPTION OF SENSITIVE AREAS ALONG PIPELINE ROUTE

### I. PORT DISCOVERY BAY

- Route passes through excessive slopes (15% or over) to reach first major sensitive area.
- Crosses Salmon and Snow Creeks (important salmon spawning areas) which terminate in Discovery Bay; exceedingly rich marine resource area.
- Area has seasonal water table depth of 0-5 feet.
- Crosses high aquifer recharge area.
- Area susceptible to flooding.
- Has high compressibility factor (low bearing capacity).
- High agricultural suitability area.

Discovery Bay considered major area for commercial shellfish production, as well as large salmon concentrations.

### II. QUILCENE AREA

- Passes through several areas of seasonal flooding to reach Quilcene locale.
- Some excessive slope areas to the north near Leland and Rice Lakes, this area is watershed for Crocker, Leland, Peterson and Tarboo Lakes.
- Crosses Big Quilcene and Little Quilcene Rivers, which feed into Quilcene Bay; a substantial marine resource area including salmon, cut-throat, crab, shrimp, herring, and oyster seeding and growing.
- Large eel-grass beds important for sustenance and support of marine resources.
- Major waterfowl area.
- Major tidal marsh area; commercial oyster industry based in this locale.
- Area has seasonal water table depth of 0-5 feet.
- Quilcene sits on large aquifer from which all domestic water is drawn.
- Area susceptible to flooding.
- Area has high compressibility factor (low bearing capacity).
- Area is considered to have high agricultural suitability.
- Beginning of an extensive area geologically unstable (sections 36, 1 and 12).

Quilcene Bay extremely important for marine resources including salmon and oyster production.

### III. JACKSON CREEK

- Passes approximately one mile west of Whitney Point (State Shellfish Laboratory) to reach main Jackson Creek area.
- Crosses Jackson and Spencer Creeks important for salmon spawning.
- Substantial marine resource area (shellfish , shrimp, herring spawn, surf smelt, salmon, and oyster seeding and growning) in Dabob Bay.
- Seasonal water table depth mostly 0-3 feet.
- This is a large aquifer recharge area.
- Crosses flood area of Jackson Creek.
- Large expanse of highly compressible geologic structure in this area.
- North side of Jackson Creek is large area of geologic instability.
- North side of Jackson Creek is large area of geologic instability.
- The proposed pipeline route passes through areas of variable slope including slope areas of 15% or greater.
- Important tidal marsh area at Right Smart Cove.

### IV. BRINNON AREA

- Pipeline route crosses Dosewallips River and passes within a mile of a federal fish hatchery situated on the delta.
- Area near hatchery important to marine resources. Water off Brinnon and the Dosewallips used extensively as marine research area.
- Major marine resource area (geoduck, cut-throat, salmon, crab, shrimp, herring spawn, surf smelt, and oyster growing and seeding).
- Large aquifer recharge area.
- Area susceptible to substantial flooding.
- Area of high compressiblity.
- This area contains acreage with agricultural suitability according to S.C.S. soil classifications.
- River bounded each side by areas considered geologically unstable.
- Route passes through terrain including excessive slope areas (15% or greater).

### V. MOUTH OF DUCKABUSH RIVER

- Important marine resource area; substantial shellfish beds, crab, shrimp, herring spawn, surf smelt, cut-throat, steelhead, salmon, and oyster growing and seeding.
- Major waterfowl area.
- Substantial eel-grass beds at mouth of Duckabush.
- Route crosses large aquifer recharge area.
- Flood area lies north of river and leads into delta.
- Area consists mainly of highly compressible geologic structure.
- Land along Duckabush suitable for agriculture.
- Within half-mile of Duckabush, route passes through large area of land considered geologically unstable.
- The terrain in this area is of variable slope, some parts considered excessive (15% or greater).

### VI. McDONALD COVE AREA

- Crosses McDonald Creek (leads to McDaniel Cove) and Fulton Creek.
- Important marine resource area (crab, shrimp, salmon, shellfish, herring spawn, and oyster growing and seeding).
- Route passes through large aquifer recharge area.
- Pipeline route crosses flood plain around Fulton Creek.
- Area considered highly compressible.
- Areas of excessive slopes.
- Pipeline route crosses geologically unstable areas from Fulton Creek south to County line.

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CONT.

APPENDIX B

# AN ANALYSIS OF
# STREAMS, RIVERS, LAKES AND ESTUARIES ALONG
# THE PROPOSED NORTHERN TIER PIPELINE ROUTE IN
# JEFFERSON COUNTY, WASHINGTON

FEBRUARY 1979

PREPARED FOR:
JEFFERSON COUNTY PLANNING DEPARTMENT

BY:
NORTHWEST ENVIRONMENTAL CONSULTANTS, INC.

## AN ANALYSIS OF
## STREAMS, RIVERS, LAKES AND ESTUARIES ALONG
## THE PROPOSED NORTHERN TIER PIPELINE ROUTE IN
## JEFFERSON COUNTY, WASHINGTON

G. Bradford Shea
and
Douglas J. Canning

February 1979

Submitted to:
JEFFERSON COUNTY PLANNING DEPARTMENT
Jefferson County Courthouse
Port Townsend, Washington 98368

By:
NORTHWEST ENVIRONMENTAL CONSULTANTS, INC.
158 Thomas Street, Suite 35
Seattle, Washington 98109

### ACKNOWLEDGEMENTS

The preparation of this report was financially aided through a grant from the Washington State Department of Ecology (DOC) with funds obtained from the National Oceanic and Atmospheric Administration (NOAA) and appropriated from Section 308(c) of the Coastal Zone Management Act of 1972.

In addition to the Washington Association of Counties, DOE and NOAA, whose funds made these studies possible, Northwest Environmental Consultants, Inc.(NEC), wishes to thank Mr. David Goldsmith and Tom Aumock of the Jefferson County Planning Department for their continued support throughout the project. We also wish to thank Mary Lou Mills of the Washington Department of Fisheries and Joe La Tourette of the Washington Department of Game for discussions of potential pipeline impacts and the interests of their respective agencies. We especially want to thank Ms. Ruth Pittman who put in many extra hours to complete the report production by the deadline.

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## I. INTRODUCTION

This report enumerates the results of field studies, data compilations and the review of relevant literature pertaining to potential impacts of the proposed Northern Tier Pipeline on rivers, estuaries, streams and lakes in Jefferson County, Washington. The first section gives existing physical conditions in each waterway. This includes all rivers and streams which will be crossed (as defined by existing plans) as well as lakes or estuaries which lie in drainage basins of the proposed corridor.

Field studies were carried out by Mr. Douglas Canning, Dr. G. Bradford Shea and Ms. Kathy Pazera of Northwest Environmental Consultants, Inc., during November, December and January (1978 - 1979) on rivers, streams and lakes along the proposed pipeline corridor. The field studies were carried out for the Jefferson County Planning Department in order to evaluate existing conditions, potential impacts and mitigative measures associated with the Nortern Tier Proposal. The study was initiated due to a lack of detailed information on the lakes, estuaries and smaller streams in the EFSEC Application and Corps Permit Applications.

Northern Tier has proposed a preliminary route within a two mile wide pipeline corridor. Theoretically, the pipeline might be located anywhere within this corridor, if problems arise with the proposed crossing locations. NEC personnel therefore attempted to survey several points within the corridor for each river, stream, lake or estuary within or downstream of the corridor. In much of the County, the pipeline will probably parallel the existing Bonneville Power Administration (BPA) powerline. The waterways investigated during this study are shown in Table 1, together with their respective receiving waters and survey dates. The existing physical and biological conditions of these areas and potential effects of the proposed pipeline will constitute the remainder of this report.

Table 1

STREAM CROSSING SURVEY SUMMARY

| River, Stream, Estuary or Lake | Receiving Waters | Survey Dates |
|---|---|---|
| Salmon Creek | Port Discovery Bay | Nov 15, Dec 2 |
| Snow Creek | Port Discovery Bay | Nov 15, Dec 2 |
| Salmon-Snow Creek Estuary | Port Discovery Bay | Dec 22 |
| Peterson Lake | Chimacum Creek | Dec 22 |
| Crocker Lake | Little Quilcene River | Dec 22 |
| Tarboo Lake | — | Dec 13 |
| Leland Lake | Little Quilcene River | Dec 22 |
| Little Quilcene River | Quilcene Bay | Dec 13 |
| Big Quilcene River | Quilcene Bay | Dec 13 |
| Quilcene Estuary | Dabob Bay - Hood Canal | Dec 13 |
| Spencer Creek | Dabob Bay | Jan 21 |
| Marple Creek | Dabob Bay | Jan 21 |
| Jackson Creek | Dabob Bay | Jan 21 |
| Turner Creek | Dabob Bay | Jan 21 |
| Dosewallips River | Dabob Bay | Nov 25 |
| Dosewallips Estuary | Dabob Bay | Nov 25 |
| Duckabush River | Dabob Bay | Nov 25 |
| Duckabush Estuary | Dabob Bay | Nov 25 |
| McDonald Creek | Hood Canal | Jan 21 |
| Fulton Creek | Hood Canal | Jan 21 |
| Donovan Creek | Quilcene Bay | * |

---

*not surveyed separately; see Quilcene Bay

At this time, the Northern Tier Pipeline Company has proposed a preliminary route and has applied for U.S. Army Corps of Engineers dredging permits for four major river crossings:

Little Quilcene River

Big Quilcene River

Dosewallips River

Duckabush River

The Corps of Engineers has not considered requiring full permits on other streams at this time, although many streams on the route could be considered as under Corps' jurisdiction.

Northern Tier Company has also submitted a multi-volume site application to the Washington State Energy Facilities Siting and Evaluation Council (EFSEC). Two environmental impact statements have been prepared on the project:

- A federal NEPA impact statement by the Bureau of Land Management (BLM)
- A Washington State SEPA impact statement being prepared by $CH_2M$ Hill Corporation for EFSEC

As of the time of this writing, only the BLM document has been issued.

In order to set the individual stream analyses in context, this Introduction concludes with a general discussion of Hood Canal dynamics, resources and, to a limited extent, economics. The remainder of the report will deal with resources on an area-specific basis.

### HOOD CANAL

### Oceanography

Hood Canal, as a sub-system of Puget Sound, is very sensitive to contamination of any type due to its flushing and water exchange characteristics. In general, the Canal has a constant but limited water exchange with the main Puget Sound system. Deep water excange of Hood Canal waters with Puget Sound waters generally only occurs during late summer. As might be expected in a 64 mile long, dead-end embayment, tidal flow and mixing are strongest in the extreme lower reach, with progressively weaker tidal flow and mixing towards the upper head of the bay.

Two factors inhibit complete, constant mixing, and rapid flushing. Two sets of sills, one near the mouth of the Canal, and another approximately 9 miles inside the Canal at South Point, reduce exchange and deep water circulation. The Dabob-Quilcene Bay inlet of the Canal also has sills at its mouth, further reducing exchange and flushing in that area.

The weak tidal action results in a salinity stratification which also inhibits complete flushing and exchange. When fresh riverwater enters the Canal, it floats on the more dense saline water with minimal mixing. This lower salinity waters forms a surface layer approximately 10 feet deep. The surface layer mixes readily with Puget Sound waters; the deeper, more saline layer generally is able to exchange only during one brief period a year in late summer (Yoshinaka & Ellifrit 1974).

At best, then, flushing of Hood Canal takes at least one year, with flushing times for southern Hood Canal likely greater. Throughout most of Puget Sound, flushing times on the order of a few tidal cycles (days) are common.

### Fisheries

The Hood Canal commercial and sports fisheries forms a substantial portion of the general Puget Sound fisheries. The data in Table 2 show that the existing Hood Canal fisheries resource catch is 16.8% of the Puget Sound catch. Shellfisheries are more important yet, comprising 26.5% of the Puget Sound harvest. With full implementation of all existing management and enhancement programs (Table 3), Hood Canal fisheries would increase to 23.1% of the Puget Sound catch. The dollar values of catches and harvests shown are based on prices paid to fishermen, and thus represent an absolute minimum value of the resource. The processed value of the resource is approximately two times the catch value. Retail sales values are three to four times the catch values. The total economic value of the resource is, or course, much greater to the Washington economy, taking into account support industries.

Table 2

DOLLAR VALUES OF PRESENT PRODUCTION OF FISHERIES RESOURCES IN SELECTED AREAS OF PUGET SOUND AND IN PUGET SOUND AS A WHOLE

| | Straits[1] | Central Sound | South Sound | Hood Canal | All of Puget Sound[2] |
|---|---|---|---|---|---|
| Shellfish | $1,264,000 | $3,003,000 | $4,177,000 | $5,798,000 | $21,917,000 |
| Commercial groundfish | 260,000 | 263,000 | 17,000 | 140,000 | 1,187,000 |
| Recreational bottomfish | 51,000 | 511,000 | 281,000 | 10,000 | 976,000 |
| Salmon production[4] | 1,958,000 | 8,833,000 | 5,545,000 | 4,163,000 | 35,380,000 |
| Herring[5] | -- | -- | 224,000 | 146,000 | 1,600,000 |
| Total | 3,533,000 | 12,610,000 | 10,244,000 | 10,257,000 | 61,060,000 |
| Salmon harvest[3] | $9,588,433 | $6,585,721 | $3,492,547 | $1,672,435 | 48,958,541 |

[1] Straits include only Port Angeles to Port Townsend for shellfish.

[2] Represents total of all selected areas listed plus Puget Sound areas not specifically designated.

[3] Salmon production and harvest figures are additive in special circumstances.

[4] 718,300 lbs. of production in Puget Sound tribal and co-operative projects is not included. Estimated dollar value of these releases is $5,387,250 annually.

[5] 1976 herring harvest used. 1975 harvest was approximately double the 1976 harvest in South Sound and Hood Canal.

Source: Sandison 1978

Table 3

DOLLAR VALUES OF POTENTIAL ANNUAL FISHERY PRODUCTION OF SELECTED AREAS OF PUGET SOUND AND OF PUGET SOUND AS A WHOLE

| | Straits[1] | Central Sound | South Sound | Hood Canal | All of Puget Sound[2] |
|---|---|---|---|---|---|
| Shellfish | $4,248,000 | $5,394,000 | $10,103,000 | $10,721,000 | $49,200,000 |
| Commercial groundfish | 757,000 | 1,274,000 | 360,000 | 213,000 | 3,719,000 |
| Recreational bottomfish[3] | 51,000 | 511,000 | 281,000 | 10,000 | 976,000 |
| Salmon production[4] | 7,684,000 | 18,298,000 | 24,666,000 | 30,030,000 | 123,387,000 |
| Herring | -- | -- | 408,000 | 264,000 | 2,800,000 |
| Total | $12,739,000 | $25,477,000 | $35,817,000 | $41,638,000 | $180,082,000 |

[1] Straits include only Port Angeles to Port Townsend for shellfish.

[2] Represents total of all selected areas plus other geographic areas in Puget Sound.

[3] No projections made on harvest increases. Present harvest used.

[4] Present production plus unconstructed Washington Department of Fisheries projects and proposed projects.

Source: Sandison 1978

River of origin production values are shown in Table 4. These data indicate the total salmon production value of each stream regardless of where the fish were harvested. Production values of the Skokomish and Quilcene rivers and Finch Creek are greatly enhanced by the presence of salmon hatcheries on those streams. Hood Canal salmon production is 11.8% the production of all Puget Sound streams.

Bottomfish landings in Hood Canal are relatively small in comparison to other Puget Sound sub-areas (Table 5), with the exception of dogfish. Hood Canal dogfish harvest comprises 35.1% of the Puget Sound catch. All bottomfish caught in the Canal comprise 13.6% of the Puget Sound catch.

The absolute and comparitive harvests of a variety of shellfish in Hood Canal and Puget Sound are shown in Table 6. Species which form a particularly substantial portion of the Puget Sound harvest are shrimp (70.5%), recreational intertidal clams (27.7%), recreational intertidal rock crabs (19.3%), and geoducks (26.5%). Of greater interest are commercial harvests of Pacific oyster seed and recreational harvests of intertidal oysters, both of which occur only in the Puget Sound system at Hood Canal.

The Washington Department of Fisheries licenses the intertidal farming of clams and oysters for commercial and personal harvest in excess of sports harvest limits. Information from the Department of Fisheries Licensing Division is available to describe the general location of intertidal clam and oyster farming. Areas of intense intertidal farming in Hood Canal and South Puget Sound are Dabob and Quilcene Bays, Seal Rock, Brinnon, Hoodsport, Union and Tahuya, and the Skookum - Oyster Bays system (Table 7).

L15 CONT

**Summary**

Hood Canal as a water body and shorelines system is unusually vulnerable to contamination due to its extremely slow flushing rate and poor tidal mixing characteristics. The Canal contributes a significant portion of the state's Puget Sound fishery.

Table 4

HOOD CANAL RIVER OF ORIGIN SALMON PRODUCTION VALUES *

| Rivers | Value, $ |
|---|---|
| Quilcene | 679,000 |
| Dosewallips | 464,000 |
| Duckabush | 311,000 |
| Hamma Hamma | 116,000 |
| Skokomish | 1,204,000 |
| Misc. Steams | 545,000 |
| Finch Creek | 750,000 |
| Dewatto | 38,000 |
| Tahuya | 56,000 |
| TOTAL | $4,163,000 |

(Puget Sound Grand Total $35,380,000)

* Does not include cooperative, tribal or federal production other than Quilcene.

Source: Sandison 1978

Table 5

ESTIMATED [1/] COMMERCIAL (ALL GEARS) LANDINGS OF BOTTOMFISH IN PUGET SOUND DURING 1976

| Species | Straits | Hood Canal | Central Sound | South Sound | North Sound | Total |
|---|---|---|---|---|---|---|
| English Sole | 117,563 | 29,986 | 592,324 | 4,361 | 710,776 | 1,455,010 |
| Dover Sole | ---- | ---- | 177,044 | ---- | 17,310 | 194,354 |
| Rock Sole | 61,515 | 4,457 | 9,487 | 479 | 167,465 | 243,403 |
| Sand Sole | 5,800 | 25 | 5,950 | 15,305 | 74,099 | 101,179 |
| Flounder | 14,446 | 794 | 68,071 | 32,035 | 491,438 | 606,784 |
| Other Sole | 155 | 100 | 800 | 100 | 400 | 1,555 |
| Lingcod | 77,049 | 8,505 | 11,266 | 24 | 53,376 | 150,220 |
| Pacific Cod | 1,237,019 | 17,933 | 109,979 | 4,885 | 1,598,777 | 2,968,593 |
| Pacific hake | ---- | ---- | 3,691,684 | ---- | 46,417 | 3,738,101 |
| Rockfish | 25,879 | 5,229 | 31,947 | 11,456 | 62,627 | 137,137 |
| Dogfish | 1,052,805 | 2,009,631 | 943,751 | 36,572 | 1,676,673 | 5,719,432 |
| Perch | ---- | 119,636 | 105,910 | 37,452 | ---- | 262,998 |
| Halibut | 5,730 | 20 | ---- | ---- | 39 | 5,789 |
| Misc. food | 7,916 | 398 | 17,324 | 1,804 | 97,937 | 125,379 |
| Misc. indust. | ---- | ---- | 81,339 | 283,911 | 129,527 | 494,777 |
| Total | 2,605,877 | 2,196,714 | 5,846,876 | 428,383 | 5,126,861 | 16,204,711 |

[1/] Data Sources: Trawl-Pattie, B. and W. Gormley. The 1976 Washington Trawl Landings by PMFC and State Bottomfish Statistical Areas. Washington Department of Fisheries, Prog. Rept. J. Press
Other gears - D. Ward, WDF State Rept. ROIFT for 1976.

Source: Sandison 1978

CONT

Table 6

ANNUAL HARVEST AND POTENTIAL ANNUAL HARVEST (IN PARENTHESIS) VARIOUS SPECIES OF SHELLFISH (IN 1000's OF POUNDS)

| Species | Hood Canal | Puget Sound | Hood Canal as % of Puget Sound |
|---|---|---|---|
| Pacific oyster (commercial) | 185<br>(550) | 2,500<br>(10,000) | 7.4<br>(5.5) |
| Pacific oyster seed (commercial) | 50<br>(150) | 50<br>(150) | 100.0<br>(100.0) |
| Octopus | 0.5<br>(50) | 60<br>(500) | 0.8<br>(10.0) |
| Dungeness crabs | 158 | 2,882 | 5.5 |
| Shrimp | 201 | 285 | 70.5 |
| Intertidal clams (sport) | 714 | 2,520 | 27.7 |
| Intertidal oysters (sport) | 115 | 115 | 100.0 |
| Intertidal crab (sport) | | | |
| Dungeness | 17 | 134 | 12.7 |
| Rock | 11 | 57 | 19.3 |
| Geoduck | 2,235<br>(5,167) | 8,443<br>(27,400) | 26.5<br>(18.9) |
| Subtidal hardshell clam (commercial dredge) | | | |
| Butter | 5.6<br>(3,169) | 319<br>(22,706) | 1.8<br>(14.0) |
| Littleneck | 0.4<br>(280) | 53<br>(5,534) | 0.8<br>(5.1) |
| Horse | 0.1<br>(420) | 484<br>(5,760) | <0.1<br>(7.2) |

Source: Sandison 1978

Table 7

INTERTIDAL CLAM AND OYSTER FARM LICENSES ISSUED BY WASHINGTON DEPARTMENT OF FISHERIES, HOOD CANAL

| Region | Clam Licenses | | Oyster Licenses | |
|---|---|---|---|---|
| | Commercial | Personal | Commercial | Personal |
| HOOD CANAL | | | | |
| Quilcene | 1 | 1 | 1 | 2 |
| Dabob Bay | 1 | 0 | 7 | 5 |
| Wa Wa Point | 0 | 1 | 0 | 2 |
| Jackson Cove | 0 | 1 | 1 | 4 |
| Seal Rock | 1 | 0 | 3 | 1 |
| Brinnon Beach Estates | 0 | 1 | 0 | 2 |
| Brinnon | 0 | 1 | 1 | 11 |
| Duckabush | 0 | 1 | 0 | 0 |
| McDonald (McDaniel) Cove | 0 | 1 | 0 | 1 |
| Triton Head/Cove | 0 | 1 | 0 | 3 |
| Eldon (Hamma Hamma) | 1 | 0 | 1 | 0 |
| Jorsted Creek | 0 | 1 | 0 | 3 |
| Eagle Creek | 0 | 0 | 1 | 0 |
| Lilliwaup | 0 | 1 | 0 | 8 |
| Hoodsport | 0 | 0 | 0 | 12 |
| Potlach | 1 | 0 | 2 | 1 |
| Union | 0 | 2 | 3 | 15 |
| Tahuya | 0 | 3 | 0 | 6 |

Source: Washington Department of Fisheries register of intertidal fisheries licenses, Licensing Department, Olympia

## II. EXISTING CONDITIONS

This section has been formatted to give a stream by stream summary of existing conditions across the pipeline corridor. For each stream, three types of discussion will be broken out:

- the first giving a physical and biological description based on field observations
- the second defining sensitive environmental areas from a combination of field studies and other existing data
- the third defining resources of known economic importance to Jefferson County

It should be noted in this context that not all valuable resources can be evaluated in economic terms. Many of the natural resources yield aesthetic values or provide a mode of living which are of high importance to county residents, but which cannot be quantified in economic terms.

CONT

The order of streams selected here is from north to south along the propsed corridor. The corridor enters Jefferson County from the northwest along the Clallam County border. After cutting southwest for several miles, it changes course to nearly due south, roughly paralleling U.S. Route 101 southbound. The pipeline corridor cuts through the town of Quilcene and then bears southwest along the western shoreline of Hood Canal to the Mason County border. South of Jefferson County, the pipeline bends east near Olympia and continues east and northeast across the Cascades to eastern Washington.

The field data sheets that follow cover physical, biological and important land use conditions in each of these water courses. The portion of each water course under consideration includes the area within one mile of the proposed corridor centerline. In the data sheets, the portion downstream of the proposed centerline is referred to as the bottom or lower end of the corridor and the upstream portion is the top or upper end.

The discussions which follow the field data sheets are keyed to a series of diagrams based on 7½ minute topographic maps of the area. Some sensitive features and resources are keyed on the map diagrams, while others are discussed only in the text. The key to map diagrams in this section is shown on page 13. Economic resources are discussed in the text, but are usually not indicated on the map diagrams.

### KEY TO MAP DIAGRAMS

| | |
|---|---|
| ▬ ▬ ▬ ▬ | Two mile wide pipeline corridor |
| ▬▬▬▬ | Tentative pipeline route |
| ～～～ | Stream |
| W | Wetlands |
| TW | Tidal Wetlands |
| E | Eelgrass Area |
| S | Salmon Spawning and Utilization |
| T | Steelhead or other trout species |
| D | Waterfowl (Ducks and others) |
| H | Harbor Seal haulout area |
| C | Subtidal or interidal clams present |
| O | Oyster leases - harvest or spat collection |
| I | Other invertebrates (shrimp and crabs) |
| ■ | Geologically sensitive areas (slope stability, steep slopes, or potentially erosive soils |

### SALMON CREEK

**Location:** The portion of Salmon Creek which was investigated includes section 23, 26 and 27 of Township 29 North Range 2 West, Willamette Meridian. The proposed crossing point occurs near the BPA power line in section 27, approximately one mile from the stream mouth.

**Observation Points:** The creek was observed at its crossing with West Uncas Road and at several points from the canyon walls upstream to approximately 1 mile upstream of the BPA power line crossing. Additionally, the streambed was waded from West Uncas Road, one mile upstream to the power line. Observations of the stream crossing of Route 101 near the mouth is reported in the Salmon - Snow Creek Estuary data sheet.

**Streambed:** Salmon Creek near West Uncas Road (bottom of corridor) is approximately 12 feet wide and 8 to 10 inches in depth, with flow velocity of 2.5 feet/second. Observed flow was roughly 20 - 25 cubic feet per second (cfs). Due to the shallow depth, riffles are predominant (75%) with occasional deeper pools of 18 to 24 inch depths. Stream substrate at the lower portion of the corridor consists of small gravel (2 to 3 inches of less in diameter) mixed with occasional rocks of six inch diameter or less. Stream gradient is low to moderate.

At the center of the corridor, stream gradient rises and the bottom characteristics change to larger rocks or boulders mixed with a coarse gravelly sand. Small waterfalls (6" - 2') are present in this area. Above the center of the corrider, the stream forks considerably. The south fork (perpendicular to the proposed route) becomes rapidly smaller, turning into the minor drainage channel within one mile.

**Streambanks:** Banks in the lower portion of the corridor range from 5 to 8 feet high near West Uncas Road to 40 to 60 foot cliffs ½ mile below the corridor center. Along these areas, the stream typically has one low bank one to three feet high with the other bank forming the canyon wall. Bank slope ranges between 45° and vertical in

CONT

a rather patchy, random manner. Streambanks are composed of loams and silt loams along the lower corridor section and sands or sandy loam along the upper reach. Streambank materials are highly erosive in places as evidenced by canyon configuration and severe undercutting.

**Floodplain, Canyon and Valley:** The floodplain varies considerably, ranging from only the width of the stream itself, to 100 feet wide in meander areas. In a few spots, patches of swamp vegetation are present in the floodplain. Large amounts of fallen timber are present in the stream and floodplain, apparently resulting from both erosion of side banks and past timber operations.

At the bottom of the corridor, the stream flows through rolling farmland (near West Uncas Road). However, within ½ mile of the mouth, canyon walls rise to a "U" shaped configuration with a 50 to 100 foot wide floodplain. Undercut sidewalls evidence a highly erosive layering of gravelly till and coarse sands. Near the center of the corridor, sideslopes become less vertical and less undercutting is present. This results in a "V" configuration along the central and upper portions, with side slopes up to 100 feet in height.

**Biological Resources:** Streamside vegetation is dominated by red alder (*Alnus rubra*), bigleaved maple (*Acer macrophyllum*), and western hemlock (*Tsuga canadensis*). Understory plants are mostly swordferns, salmonberry willows and grasses. Upland species on the canyon walls include maple, alder and douglas fir (*Pseudotsuga menziesii*).

No fish were observed during field observation. However, the lower creek provides spawning gravels which are utilizable by salmon and steelhead. The stream valley is forested and probably has high wildlife value.

**Land Use Features:** Human use of the land adjacent to the lower corridor is farming (mainly cattle). The upper corridor borders the Olympic National Forest. Forest harvesting has effected the stream channel through minor siltation and major amounts of jammed timber.

### SALMON CREEK: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

**Slopes and Topography:** Much of the creek basin above West Uncas Road has slopes in excess of 30 percent (U.S. G.S. 1973). The stream canyon is V-shaped, with little or no flat area on the sides. These areas have been mapped in Figure 1. The downstream portion of Salmon Creek, between West Uncas Road and the estuary, lies in a flat to rolling flood-prone area (Jefferson County 1978).

**Soils and Erosion:** The Salmon Creek basin can be divided into 2 basic soil types, roughly divided by the crossing of West Uncas Road. Those upstream of this crossing (including the proposed pipeline area) are Alderwood gravelly sandy loams on slopes of 15 to greater than 30 percent. These soils are generally only loosely compacted and are highly erodable (McCreary 1975, Jefferson County 1978). Severe undercutting of vertical and near vertical cliffs can be found along the stream channel.

The soils in the lower basin are predominantly Belfast soil loams. These soils are highly compressible (Jefferson County 1978, McCreary 1975), and are erodable during periods of flooding. Little erosion occurs at other times due to their low slope.

**Vegetation:** The vegetation along Salmon Creek, above the estuary, is not particularly sensitive.

**Fish and Wildlife:** Salmon Creek is accessible to migrating anadromous fish throughout the entire pipeline corridor. The only blocking falls occur above Mile 6 (Williams *et al*. 1975). Stream lowflow has been measured at 1 cfs (Williams *et al* 1975) average flow and may be well over 5 cfs. The stream is heavily utilized by steelhead trout (Jennings *et al*. 1977). The lower stream reach is a prime chum salmon spawning ground. Fish counts during spawning usually range into the hundreds throughout the lower stream mile. Peak counts of 1120 fish per mile occurred in September of 1976 (Egan 1977). These levels

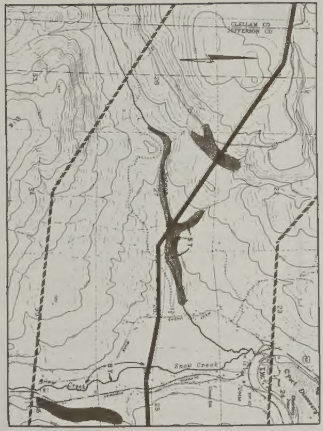

Figure 1. Salmon Creek, Snow Creek and Salmon - Snow Creek Estuary (Scale 1:24000)

may be typical on good escapement years. Coho slamon, fall chinook and a few pinks also use the upper stream reaches, but in lower abundance than chum. Various wildlife such as deer and blackbear use the nearby forest areas (Yoshinaka and Ellifrit 1974) and depend on the stream for habitat.

Economic and Recreational Resources: Salmon Creek is a well-used sports fishing area (Jefferson County 1978). Since the upper reaches are not easily accessable, the stream has remained largely natural with the exception of the fishing use. The Washington State Department of Game is using the creek for fish baseline studies in a long-term fisheries research program.

### SNOW CREEK

Location: Snow Creek runs north toward Discovery Bay along the section lines of Sections 23 to 24, 25 to 26, and 35 to 36 in Township 29-N Range 2-W and in Sections 1 and 2 in Township 28-N Range 2-W Willamette Meridian. Upstream of this point, the creek turns west, away from the proposed pipeline route. The proposed crossing occurs near the BPA powerline, within one mile of the stream mouth.

Observation Points: The stream was observed at the Washington Game Department Fish Research Facility (fishtrap and holding area) near the proposed crossing point, at West Uncas Road and near the junction of Route 101 and State Route 104. Observations of the stream mouth are reported in the Salmon-Snow Creek Estuary data sheet.

Streambed: The stream is relatively uniform in width throughout the corridor, generally 15 to 20 feet wide. Depth varies from 6 to 12 inches in riffle areas and up to 18" at mid-channel or in pools. Flow velocity is 4 to 5 feet per second with an overall flow volume of about 50 cfs on the day of observation. Riffle areas make up 70 to 80 percent of the stream with the remainder composed of pools. On the day of observation (December 22), stream temperature was 3.2°C and conductivity was measured at 70 μmhos. (Conductivity is an indirect measurement of dissolved substances in water. The normal range in fresh water is 50 to 500 μmhos.) The streambottom is covered with fine gravels (0.05 to 2.0 inches) and coarse sands. Silty sands tend to settle out in slow moving areas on the outside curves of oxbows. The stream contains significant nutrients in the form of fallen leaves, but only moderate amounts of fallen logs or debris.

Streambanks: Streambanks vary from gentle 3 foot banks with 40% percent slope to nearly vertical 5 to 6 foot high banks along the farmfield in the southern end of the corridor. Further north, the stream passes through wooded areas and other fields with higher banks up to 20 to 25 feet high with 100 to 150 percent slopes. In this northern section, bank soils are very silty and appear prone to moderate erosion.

Floodplain and Valley: The stream floodplain is 20 to 30 feet wide in most areas. At the northern end, near Port Discovery, the banks funnel the stream closely, allowing little chance of overflow. Snow Creek meanders through a broad farm valley interspersed with wooded areas. There are no steep canyons or valley walls near the stream. However, moderately steep foothills of the Olympic Mountains do begin within a few hundred yards of the streambed in places.

Biological Resources: Streamside vegetation in the farmfield portions consists mainly of red alder and bigleaved maple. Horsetail (*Equisetum* spp.) and reed canary grass (*Phalaris* spp.) are scattered among salmonberry and blackberry bushes (*Rubus* spp.) to form the groundcover vegetation. In forested areas, alder, western red cedar and western hemlock form the major streamside species, with douglas fir being found in the adjacent uplands. Swordfern and horsetail form the main streamside groundcover in the forested areas.

Fish were not observed in the stream directly during field observations. However, the Washington State Game Department has reported extensive salmon and steelhead runs, which are documented in reports from their Fisheries Research Facility on Snow Creek (Jennings *et al.* 1977).

Land Use Features: The surrounding land use is agricultural, with some commercial establishments (gas station and cafe) near the mouth of Snow Creek. The creek is also used by the Game Department for fisheries research.

### SNOW CREEK: ENVIRONMENTAL AND ECONOMICALLY SENSITIVE AREAS

Slope and Topography: Snow Creek runs through a relatively flat valley throughout the pipeline corridor. The basin is subject to flooding. Additionally the pipeline route crosses aquifer recharge areas which flank the entire corridor.

Soils and Erosion: Snow Creek soils are predominantly Belfast silt loam (McCreary 1975), a highly compressible organic soil. These soils would be subject to erosion only when unprotected, due to their low slopes.

Vegetation: Vegetation along Snow Creek, above the estuary, is not any more sensitive than any other riparian vegetation.

Fish and Wildlife: Snow Creek contains significant numbers of steelhead trout. It is also used by spawning chum and coho salmon, with numbers of spawners ranging into the hundreds at a given time. The chum are generally found near the mouth, with coho ranging above Stream Mile 4 (Egan 1977). Small numbers of pink and chinook salmon are also found.

Economic and Recreational Resources: Sports fishing is prevalent along Snow Creek due to both good fish populations and easy access. The Washington State Department of Game operates a fish trap research facility on the creek as part of a baseline program on fisheries resources.

### SALMON SNOW CREEK ESTUARY

Location: The estuary is located near the section lines of Sections 23 and 24 of Township 29 North, Range 2 West, Willamette Meridian. The proposed crossing point occurs approximately one-half mile south of the estuary.

Observation Points: Stream measurements were made from the U.S. Route 101 bridge over Salmon Creek, and portions of the marsh between the creeks and their various sloughs were investigated on foot.

Streambed: Most of the sloughs are 10 to 20 feet wide, varying with tidal depth. Depths range generally from one to eight feet depending on tidal actions. Measurements from the Route 101 highway bridge showed Salmon Creek to have a temperature of 5°C and a salinity of 0.25 parts per thousand (fresh water) near the bridge on an outgoing tide. Some salinity undoubtedly reaches the bridge on strong incoming tides.

Tideflats and Wetlands: Salmon and Snow Creeks join to form a wide tidal marsh at the head of Port Discovery Bay. Wetland vegetation covers the tideflats for a distance of ½ mile or more, with mudflats extending considerably further than this at low tide. The wetlands are composed to two marsh zones (high and low tidal marsh) and are surrounded by upland grasses along the highway. Channelbanks are moderately sloped (40 to 100 percent) and the substrate is a medium brown silty peat.

Geomorphology: Salmon and Snow Creeks drain into a narrow wedge shaped section at the head of Port Discovery Bay. The bay is surrounded by steep hillsides 100 to 300 feet in height along most of its border. The wetlands and tidal flats of the Salmon-Snow Creek delta form the major wetlands in Port Discovery Bay.

Biological Resources: The upper marsh is a fairly low diversity community dominated by marsh aster (*Aster suspicatus*) and bentgrass (*Agrostis* spp.). The lower marsh contains sedge along the slough edges (*Carex* spp.), as well as arrowgrass (*Triglochin* spp.), lovegrass (*Eragrostis* spp.), dock (*Rumex brittanica*) and yarrow (*Acheillia millefolium*). The vegetation indicates a brackish - fresh marsh which frequently experiences moderate to high salt concentrations. The marsh provides habitat for juvenile fish using Salmon and Snow Creeks and, together with the tide flats, habitat for shellfish and other invertebrates.

Land Use Features: The marsh area is bordered by highways, a railroad truck and nearby light density commercial and residential buildings.

### SALMON - SNOW CREEK ESTUARY:
### ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: There are no slopes in the estuary.

Soils and Erosion: Estuarine soils and sediments are highly compressible peat and muck (McCreary 1975). This is not a sensitive soil type since the estuary lies well away from the pipeline route.

Vegetation: The estuary is a valuable tidal wetland throughout both the vegetated tidal marshes and the unvegetated tidal flats (KEC 1975). The vegetation is typical of a tidal saltmarsh as described in the previous section. Such vegetation is sensitive to rapid sedimentation or to damage by oils. The tidal mudflats and their associated fauna are also sensitive to these two factors.

Fish and Wildlife: Port Discovery Bay contains substantial shellfish resources, mainly concentrated in the wetlands of the Salmon - Snow Creek Estuary. The region from Maynard to Mill Point contains a major subtidal hardshell clam bed consisting of 21 acres. Recent counts revealed 118,918 butter clams and 155,507 littneck clams (Goodwin and Shaul 1978). Discovery Bay shorelines also contain sport beds of geoducks. The entire bayshore contains an estimated 591 acres of moderate density geoduck sports beds. The 2.5 million clams estimated in these beds result in a classification as a major bed (Goodwin 1978).

Additionally, the tidal marshes serve as spawning grounds for chum salmon and rearing grounds for salmon and trout.

Economic and Recreational Resources: The Salmon - Snow Creek Estuary and nearby areas of Discovery Bay serve as a major commercial shellfish resource. In addition, sports shellfish harvesting occurs throughout the delta and bay shoreline. The tidal marshes provide rearing and spawning habitat for anadromous fish.

### LAKES

Peterson, Crocker, Tarboo and Leland Lakes are all contained within the two mile wide pipeline corridor. While the pipeline is not planned to physically cross any of these lakes, they will receive drainage effects from construction and could be affected by an oil leak. The potential for such effects depends on the exact route chosen. In some cases, a choice of another pipeline route could remove the pipeline from the drainage basins occupied by these lakes. Field observations or potential effects mentioned in the following data sheets are based on the assumption that the pipeline is to be placed in their respective drainage basins.

### PETERSON LAKE

Location: Peterson Lake is located in Section 6 of Township 28 North, Range 1 West, Willamette Meridian, less than one mile north of State Route 104. The lake is within one quarter mile (to the east) of the BPA right-of-way and the proposed pipeline route and occupies the bottom of the drainage basin at that point.

Observation Points: The lake is privately owned by one landowner (Mr. Peterson) whose ancestors homesteaded the area in the 1800's. The lake was observed from the Peterson residence and eastern shoreline.

Physical Characteristics: Peterson Lake is a small lake, roughly 1,000 feet in length and 500 feet in width. The lake is surrounded by deciduous forest with one residence on the southeast side. Wetlands are composed only of sparse patches of canary grass and cattail. To the west, a low ridge rise to the BPA powerline right-of-way.

Biological Resources: The lake is surrounded by alder forest, with only occasional cedars or douglas fir. Ducks observed on the lake were 20 to 25 in number, including mallards, coots, widgeon and goldeneye. Evidence of beaver was also observed.

Land Use Features: Except for one residence, the lake is surrounded by second growth alder forest.

### CROCKER LAKE

Location: Crocker Lake is located in Section 12 of Township 28 North, Range 2 West, Willamette Meridian. It lies ¼ mile west of the proposed pipeline route and would be in the drainage basin if the pipeline were placed significantly to the west of the BPA right-of-way. Crocker Lake is man-made, created through damming the outlet within the past 20 years. The lake lies immediately southeast of the intersection of U.S. Route 101 and State Route 104.

Observation Points: The lake was observed from the public boat launch ramp on the west side and from nearby points along the western shoreline.

Physical Characteristics: Crocker Lake is a man-made lake created in the 1950's or early 1960's. It is roughly circular, being 2000 feet long in a north-south direction and nearly 1500 feet wide. The lake has moderate nutrient concentrations and conductivity was measured at 58 μmhos. Small marshes fringe the edges of the lake.

Biological Resources: The lake is mostly lined with grasses such as reed canary grass. However, fringe marshes of spirea (*Spirea douglasii*) and cattail (*Typha latifolia*) line the eastern, southern and western edges in 30 to 50 foot wide stretches of shallow water.

The lake and its marshes attract significant numbers of waterfowl. Fifty to seventy birds were observed on a typical December afternoon. Approximately ½ of the birds were coots, with another 20 to 25 being bufflehead. Other ducks included mallards and pintails. Fish are probably stocked by the State Department of Game.

### TARBOO LAKE

Location: Tarboo Lake is located in Sections 7 and 18 of Township 28 North, Range 1 West, Willamette Meridian at the end of an unimproved gravelled road several miles in length. The lake is ½ mile east of the BPA right-of-way and lies within the proposed pipeline corridor.

Observation Points: The lake was observed from the southeast side at the public boat launch ramp.

Physical Characteristics: Tarboo Lake is approximately 2000 feet long and less than 100 feet wide. The shorelines slope gradually and the lake does not appear to be unusually deep. The water is very clear, the lake apparently being oligotrophic. The bottom is composed of small gravels imbedded in sandy silt. The lake has many floating logs and other woody plant debris.

Around the lake the land grades off in a relatively low slope. Toward the west, the land rises slowly toward a low ridge, with the powerline running north-south immediately below the ridge. The proposed pipeline route is within the lake drainage bowl.

Biological Resources: The lake is fringed by minor marsh areas (cattail, spirea) and at the southern end by a more extensive swamp. Swamp dominants are alder, willow, red cedar and salmonberry, with salal extensively covering stumps and downed logs.

No waterfowl or fish were observed during the field observations. However, fish are undoubtedly present either as residents or stocked gamefish. One water ouzel (small water-dwelling bird) was feeding in the lake during field observations.

Land Use Features: The lake has a public boat launch ramp near the southeast corner and is otherwise surrounded by second growth trees.

### LELAND LAKE

Location: Leland Lake is located in Sections 24, 25 and 26 of Township 28 North, Range 2 West, Willamette Meridian along U.S. Route 101. The lake is nearly one mile west of the BPA powerline and the proposed pipeline route. However, it is at the bottom of the drainage basin of several small streams which cross the powerline and pipeline route.

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Observation Points: The lake was observed from three points along the southern shoreline, including the public boatlauch ramp.

Physical Characteristics: The lake is nearly a mile long and less than a quarter mile wide. The shoreline slopes down rapidly into deep water with only very minor fringe wetlands. The southern side of the lake is bordered by a road and scattered residences, while the northern side is bordered by deciduous forest. Water clarity is good, and the lake seems to have relatively low nutrient levels, as might be expected of a glacial lake. Conductivity was measured at 60 umhos. A stream feeds the lake from the east, which begins in the vicinity of the BPA powerline right-of-way and the proposed pipeline route.

Biological Resources: Forest areas along the northern edge are composed mainly of alder with some western red cedar and douglas fir. The small, scattered fringe marshes contain only common rush (*Juncus effusus*) and reed canary grass (*Phalaris* spp.).

Waterfowl observed included 10 coots, 4 bufflehead, one swan and several domestic geese (the latter at or near a farm at the southeast corner of the lake). No fish were observed. However, resident and gamefish are probably present.

Land Use Features: The lake is bordered on the south side by a few residences and farms, as well as a motel and gas station. The north side is bordered by forest.

## PETERSON, CROCKER, TARBOO AND LELAND LAKES: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: Peterson, Crocker and Tarboo Lakes are shown in Figure 2 . Leland Lake is shown in Figure 3. The lakes all occur at the bottom of moderately sloped drainage basins. Although the pipeline will not cross any lakes, drainage from pipeline construction or spills will flow toward the lakes entering directly from overland runoff or from the small streams that drain into the lakes. Flow out of Peterson Lake enters Chimacum Creek; flow out of Crocker Lake enters Snow Creek; flow out of Leland Lake enters Leland Creek, which ultimately connects with the Quilcene system; and flow out of Tarboo Lake is essentially non-existant, becoming groundwater and wetland seepage. Steep slopes (over 30 percent) around the lake drainages are indicated in Figures 2 and 3. Any contaminants from the pipeline would cross aquifer recharge areas in the vicinity of Peterson, Crocker or Leland Lakes.

Soils and Erosion: Peterson and Crocker Lakes are in an area of Alderwood gravelly loam on 0 to 30 percent slopes. Crocker Lake also has Mukilteo and McMurray peat around its borders. Leland Lake is in an area of Alderwood gravelly sandy loam, while Tarboo Lake has Alderwood gravelly sandy laom on the upper slopes, toward the pipeline, with Swanntown-Alderwood soils immediately around the lake. The Alderwood soils are weakly cemented and subject to erosion in steeper slope areas. The Swanntown complex contains excessive fine particles with a high surface water table (McCreary 1975).

Vegetation: Crocker Lake is surrounded by a marsh border generally 40 to 100 feet wide. This wetland is of importance to waterfowl and fish which are stocked in the lake. Freshwater wetlands in a contained lake would be susceptible to pollution by oil or hydrocarbons. Tarboo Lake contains a swamp wetland at the southern end. Peterson and Leland Lake have only minor fringe wetland plants.

CONT.

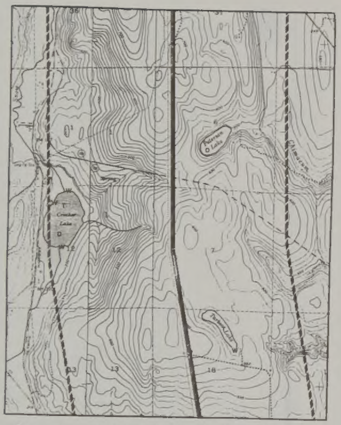


Figure 2. Peterson, Crocker and Tarboo Lakes (Scale 1:24000)

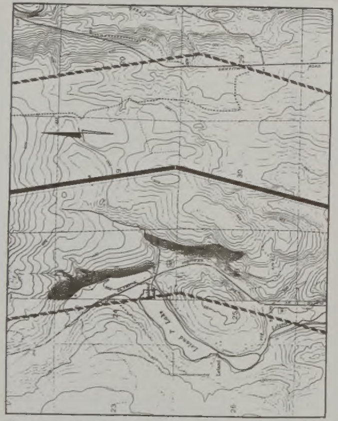


Figure 3. Leland Lake (Scale 1:24000)

CONT.

Fish and Wildlife: All of these lakes (except Peterson) are stocked by the Department of Game with various trout species. Peterson Lake is privately owned and probably contains only indigenous fish. All of the lakes are also used by waterfowl to some extent. The largest counts were noted on Crocker Lake, probably due to the more extensive wetlands area. The lakes are also undoubtedly important to large mammals such as deer, bear and possibly elk, although little documentation exists on this subject.

Economic and Recreational Resources: Peterson Lake is privately owned and therefore has no public economic or recreation uses. Tarboo, Crocker and Leland Lakes all have boatlaunch ramps and are stocked with sports fish. They are important sport fishing and general boating areas.

## LITTLE QUILCENE RIVER

Location: The portion of the Little Quilcene River System within the pipeline corridor is located in Sections 11, 13 and 14 of Township 27 North, Range 2 West, Willamette Meridian. The proposed pipeline route is within ½ mile of the river mouth at the crossing point.

Observation Points: The Little Quilcene River was investigated at four points in addition to the tidal flats at the mouth. Locations included two road pulloffs ⅛ and ¼ miles from the mouth to the east of U.S. Route 101, the U.S. 101 Bridge and one point ⅛ mile upstream from the U.S. Route 101 Bridge (this point being nearly one mile upstream of the proposed pipeline crossing). The river mouth area is reported in the Quilcene Estuary data sheet.

Streambed: The streambed is relatively consistant in character over the one mile reach above the pipeline route and almost to the river mouth. The streambed is generally 20 to 30 feet wide with a maximum depth of 2 to 3 feet in run-riffle areas. Water velocity on the day of field observation was 4 to 6 feet/second near the mouth and nearly 8 feet/second in areas near the U.S. Route 101 bridge. Total flow volume at that time is estimated at 250 to 300 cfs. Riffle areas probably comprise 50 percent of the lower stream reach, while runs and pools comprise 20 to 30 percent each. The substrate is large gravels (2 to 4 inch diameter) ranging up to large, one foot diameter rocks.

Streambanks: Streambanks are low (2 to 3 feet high) near the river mouth, rising to 8 to 15 feet through most of the corridor. Bank slopes average 50 to 125 percent. At some point upstream from the U.S. Route 101 Bridge, bank slopes become higher, forming nearly vertical erosional banks up to 30 feet in height. Bank soils in these areas are found to be a yellow brown sandy loam which is quite prone to erosion.

Floodplain and Valley: The floodplain varies from the width of the stream itself in high bank areas to a 50 to 75 foot wide plain. Near the river mouth, the floodplain becomes less distinct, merging with the surrounding lowland valley and tideflats. The flood channel is generally U-shaped and is less than 20 feet in depth in most areas. The surrounding lowland valley has been carved over geologic time by both the Big and Little Quilcene Rivers and is a broad rolling area. Above the first river mile, slopes and river gradient become steeper in low foothills of the Olympic Mountains.

Biological Resources: Riverbank vegetation is mostly alder and swordfern. In places, red cedars and bigleaved maples are mixed-in with the alders. Salmonberry and blackberry bushes are also found.

Numerous salmon, probably chum or coho, were observed swimming upstream against the current during field observations. Up to 50 fish were seen in stream segments less than 30 feet long. Stream escapement in the Little Quilcene is probably in the thousands. Shellfish are mainly confined to the Quilcene Estuary, which does not penetrate more than a few hundred feet up the river due to current and gradient.

Land Use Features: Land near the river is relatively flat or gently rolling. Most of the land is still devoted to farming. However, residential use is increasing, particularly toward the south and east of the City of Quilcene. The City of Quilcene uses the Big and Little Quilcene watersheds for domestic water supply.

## LITTLE QUILCENE RIVER: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The crossing of the Little Quilcene River occurs in a flat lowland. The area is in a flood-prone river valley. Steep slopes over 30 percent do exist in the upper river valley as shown in Figure 4.

CONT.

Soils and Erosion: The Little Quilcene River floodplain lies in an area containing Belfast fine sandy loam and Belfast silt loam soils. The slopes above the river are diverse and include Quilcene silt loam, Alderwood - Quilcene complex, Hoodsport gravelly loam and Cassolary sandy loam. The Belfast soils are poorly drained and highly compressible. The Alderwood, Quilcene and Cassolary soils are highly erodable, but occur mostly above the proposed pipeline route.

Vegetation: The vegetation, upstream from the estuary, is typical riparian vegetation and is not overly sensitive.

Fish and Wildlife: The Little Quilcene River support runs of steelhead and searun cutthroat trout (Yoshinaka and Ellefrit 1974). Chinook chum and coho salmon utilize the river for spawning throughout the corridor, with most of the chum production near the mouth. Chum salmon spawn in the hundred during migratory times, occasionally peaking at 2000 to 2700 fish per mile. Densities over 900 fish per mile are quite common during September and October. Coho are less dense, but sometimes number 100 to 250 fish per mile (Egan 1977). Spawning gravels are prevalent in the lower river (Williams *et al*. 1975).

Economic and Recreational Resources: The river is an important area for sports fisheries. Spawning salmon which use the river are important to commercial fishermen after they rear and leave the stream for Puget Sound. Considerable commercial shellfish resources are found in the estuary below the river (see Quilcene Estuary).

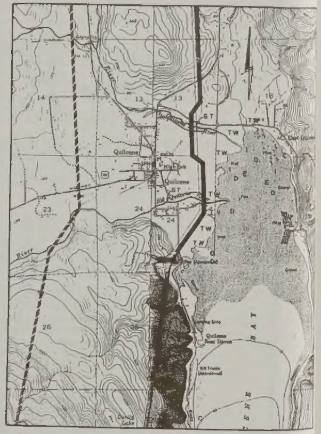


Figure 4. Big and Little Quilcene Rivers and the Quilcene Estuary. (Scale 1:24000)

## BIG QUILCENE RIVER

Location: The Big Quilcene River (Quilcene River) is located in Sections 22,23 and 24 of Township 27 North, Range 2 West, Willamette Meridian, within the pipeline corridor. The proposed pipeline route crosses within ½ mile of the river mouth. The mouth area is reported in the Quilcene Estuary data sheet.

Observation Points: The Big Quilcene River was observed from the BPA powerline crossing, ⅓ mile above the river mouth. Other observation points were a county road crossing, 1000 feet upstream of the powerline and the U.S. 101 Bridge area, at the upstream extreme of the proposed pipeline corridor. The proposed crossing occurs on the east side of the BPA powerline right-of-way.

Streambed: The Big Quilcene River is generally 50 feet wide and 6 inches to 2 feet deep with a flow velocity during field observations of 2 to 4 feet per second. The estimated flow volume was 200 to 250 cfs. Most of the river is composed of riffle and run type flows with few pools in this lower reach. The substrate is generally medium gravels or large rocks intermixed in a matrix on the river bottom and lower banks. The gradient begins to rise in the area of the U.S. 101 Bridge and flow becomes more rapid, probably 4 to 6 feet per second.

Streambanks: The streambanks are 50 to 15 feet high along the lower end of the proposed corridor and are supplemented by 40 to 6 foot high dikes in places. Bank slopes are generally 50 to 200 percent. Banks become higher in the vicinity of U.S. Route 101, rising 30 to 40 feet above the stream. Banks are generally composed of a medium brown silt-loam.

Floodplain and Valley: The floodplain generally varies between the width of the stream in places and 100 foot wide where the banks do not rise directly from the streambed. The floodplain is generly U-shaped within a gently rolling broad valley. The valley is generally cleared for agriculture near the river mouth, becoming predominantly forested toward the upstream end of the proposed pipeline corridor.

Biological Resources: The river is predominantly lined with alders and a few maples. Evergreens are present only as a few scattered trees in the upper portions of the corridor.

Numerous spawning salmon were observed in the river during field inspections. In one 20 foot section of the stream near the U.S. Route 101 Bridge, eight spawning salmon and six dead salmon were observed. The salmon were probably chum and coho mixed; however, the dead fish were partly decomposed and could not be accurately keyed. Like the Little Quilcene, annual escapement of salmon and steelhead probably runs in the thousands. The salmon dying after spawning provides important food supplies for streamside scavengers such as raccoons and bears and form a particularly important food source for those animals who hibernate. The decomposing fish also add important organics to the streams.

Land Use Features: The lower river reach is surrounded by agricultural and residential land. The upper areas are surrounded by forest.

## BIG QUILCENE RIVER:
## ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The proposed crossing occurs in a flat farm valley. Within ½ mile upstream the southern banks become steep with slopes greater than 30 percent. The lower area, however, is prone to flooding. South of the crossing, the pipeline route climbs steep, unstable slopes, overlooking Quilcene Bay. In addition to their geologic hazards, these slopes form an aquifer recharge area.

Soils and Erosion: The lower river valley soils are Belfast silt loam and Lummi silt loam. These are flanked to the north by Hoodsport very gravelly sandy loam, and to the south by Kitsap gravelly loam and Alderwood gravelly sandy loams. Alderwood and Everett gravelly sandy loams are found on the steep slope south of the crossing. These soils are highly erodable if exposed (McCreary 1975).

Vegetation: The riverside plant communities are typical riparian communities (above the estuary) which are not particularly sensitive.

Fish and Wildlife: In addition to substantial runs of steelhead and searun cutthroat trout, the Big Quilcene River supports roughly 9 miles of salmon usage by coho, pink and chinook, and two to three miles of usage by chum. It is the only river in the basin that can support substantial numbers of chinook, with runs sometimes exceeding densities of 100 chinook per mile. Peak chum runs frequently range between 1000 and 2200 fish per mile (Egan 1977). The entire lower river is heavily covered with gravel spawning areas.

Economic and Recreational Resources: The Big Quilcene River is heavily used by sports fishermen. Access is good and trout populations are high. There is a fish hatchery located on the river above the U.S. Route 101 highway bridge. Salmon escapment from the river is extremely high, particularly chum salmon in the lower reaches, and provides economic importance for the commercial and Indian salmon fisheries throughout Puget Sound.

## QUILCENE ESTUARY

Location: The Quilcene Estuary is composed of the estuarine portions of the Big and Little Quilcene Rivers and associated tidal flats. It occupies parts of Section 24 and Township 27 North Range 2 West and Sections 18 and 19 of Township 27 North Range 1 West, Willamette Meridian. The estuary is within the pipeline corridor and is less than ½ mile east of the proposed pipeline route.

Observation Points: The estuary was observed from tidal flats near the mouths of Donovan Creek, the Big and Little Quilcene Rivers, and several points along the western shoreline of Quilcene Bay. In addition, a small slough, immediately south of the Big Quilcene River was investigated in some detail.

Tideflats and Wetlands: The Big and Little Quilcene Rivers, along with Donovan Creek and a variety of small sloughs, form an extensive wetland system along the west shore of Quilcene Bay. The wetlands are generally ½ mile or less in extent from the shore to the bay and form a broad lateral band more than a mile long from Donovan Creek, south past the Big Quilcene River. Tidal flats extend a few hundred feet or more beyond the wetlands under normal low tide conditions. The low and high marsh zones are broken at the river mouths by intrusions of freshwater species including small alders. The substrate varies from sand to a silty mud.

Geomorphology: The two Quilcene Rivers enter the Bay at a distance of ½ mile on the western side of the Bay. Quilcene Bay is surrounded by low rolling hillsides to the east, and empties into Dabob Bay to the south. The tideflats and wetlands of the Quilcene Rivers and Donovan Creek form the major tidal wetlands of Quilcene Bay.

Biological Resources: The upper marshes are composed of aster (*Aster suspicatus*), silverweed (*Potentilla pacifica*) and angelica (*Angelica lucida*). The lower marsh is dominated by saltgrass

(*Distichlis* spp.) and contains sedges (*Carex lyngbyei*) along the sloughs and creekbanks.

Quilcene Bay is a major oyster growth and harvesting area. Commercial shellfish operations are located within ½ mile south of the Big Quilcene River. Chum salmon utilize the small marshy sloughs near the river mouths. Up to 20 to 30 spawning chum salmon were observed within a 30 foot long reach of a small slough in a tidal marsh located ¼ mile south of the Big Quilcene River. The marshes also provide important rearing grounds for salmon and other anadromous fish.

Land Use Features: The estuarine wetlands are bordered along their upper edges by scattered residences and farmfields.

## QUILCENE ESTUARY:
## ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The estuary is a relatively level system of tidal marshes and mudflats. Steep slopes do occur to the south along Quilcene Bay. These slopes are geologically unstable (Jefferson County 1978).

Soils and Erosion: The estuarine soils are characterized as Lummi silt loam and tidal marsh (McCreary 1975). These soils are highly compressible. The steep slopes to the south are erodable, and any erosion or oil leakage would enter Quilcene Bay, with a good probability of being spread north to the estuary by tidal action.

Vegetation: The estuary is characterized by a relatively diverse tidal marsh, cut by many sloughs and guts. The vegetation supports substantial wildlife resources and would be sensitive to effects of sedimentation or oil spillage. Any major spill on the Big or Little Quilcene Rivers would cover the tidal marsh vegetation with oil which would be difficult or impossible to remove.

Fish and Wildlife: Quilcene Estuary and Bay supports one of the richest assemblages of fish and wildlife resources on the Olympic Peninsula. The upper bay is listed as a prime waterfowl area and an important eelgrass bed (Yoshinaka and Ellifrit 1974). The rocky shores south of the estaury form an important haulout area for harbor seals, with peak count reaching 168 seals in 1977 (Calambokidis 1978).

Chum salmon use the marsh guts and sloughs for spawning at very high densities (see field data). Coho chinook, pink and chum salmon also use the marshes for rearing. Searun cutthroat and steelhead trout which spawn in the rivers also depend on the estuary for vital protions of their life processes. Smelt and herring also utilize the estuary for spawning.

Quilcene Bay provides an oyster harvesting area of high significance. It is the only area on Hood Canal where spat are commercially set. Commercial spat set and harvest leases are dotted throughout Quilcene Bay.

Clambeds of subtidal and softshelled clams are present at the southern end of Quilcene Bay but are not intimately associated with the estuary. Shrimp and crabs, however, are harvested in considerable numbers at the north end, near the estuary.

Economic and Recreational Resources: Oyster harvest is probably the highest direct economic usage of the bay and estuary. In addition the estuary supports numerous salmon which are commerically harvested in Puget Sound. Other fish are utilized by commercial harvesters and sports fishermen. Shrimp and crabs are also harvested. The waterfowl also provide some limited hunting.

## SPENCER CREEK

Location: Spencer Creek flows southeasterly along U.S. 101 through the pipeline corridor in Sections 11, 14, and 13, Township 27 North, Range 2 West, Willamette Meridian. The tentative pipeline crossing is just east of the B.P.A. powerline in the northwest ¼ of Section 13.

Observation Points: Spencer Creek canyon was observed from the top of the canyon at the B.P.A. powerline. The creek bed was inspected at the crossing of U.S. Route 101.

Streambed: The streambed is 5 to 7 feet wide and varies between 1 and 3 feet in depth in run and riffle areas. Pool areas are deeper; however, exact depths were not determined. The substrate is rocky with occasional large (to 2.5 feet diameter) boulders.

Streambanks: Streambanks are variable, ranging from 1 to 3 feet tall, and are composed of stream boulders and mineral soil.

Floodplain, Canyon & Valley: Spencer Creek has no floodplain except near its mouth. The creek flows in a "V" canyon. Canyon slopes vary and are steepest in the northwest quarter of Section 13, the tentative pipeline crossing location. Soils are similar to those of Jackson Creek canyon (see discussion below).

Biological Resources: Stream-side red alders provide a moderate to good stream canopy coverage along most of Spencer Creek through the pipeline corridor. Canyon slopes are forested by Douglas-fir and western redcedar except in the northeast quarter of Section 14, which has been logged along the northeast side of the creek.

Land Use Features: Land along the creek is used principally for forestry.

## SPENCER ESTUARY

Location: Spencer Estuary is an arm of Jackson Cove in Section 13, Township 27 North, Range 2 West, Willamette Meridian.

Observation Points: Observations were made at the mouth of the creek.

Tideflats and Wetlands: There is no substantial amount of tidal marsh in Spencer Estuary. Narrow fringes of high marsh rim the estuary edge. The intertidal flats cover 6 to 7 acres.

Biological Resources: On the day of field inspection (21 January 1979) 130 to 160 chum salmon carcasses were lying in the lower 300 feet of the creek bed and head of the estuary.

Pacific oysters shells noticeably litter the beaches, indicating a substantial private sports fishery.

Land Use Features: The main uses are for forestry.

## SPENCER CREEK AND SPENCER - JACKSON ESTUARY
## ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: Spencer Creek canyon is a V-canyon, 200 feet deep near the streammouth. Slopes at the pipeline crossing point are well in excess of 30 percent. Toward the western side of the corridor, the stream gradient climbs rapidly and side-slope steepness and depth decline (See Figure 5 ).

Soils and Erosion: The streambottom and floodplain soils of Spencer Creek are Swantown gravelly loams. Surrounding soils include Hoodsport very gravelly sandy loam, Ahl very gravelly loam, Grove very gravelly loamy sands and other more minor series. The sandy and gravelly loams are prone to erosion in steep slope areas all along the canyon walls.

Vegetation: The riparian vegetation is not unduly sensitive. Canyon-side vegetation removed on the route will be difficult to restore.

Fish and Wildlife: Spencer Creek has a limited spawning area, but does contain runs of steelhead and searun cutthroat trout at the lower end of the corridor. Salmon spawning investigations in recent years indicate that at least 400 to 800 chum are using the lower 0.7 miles of Spencer Creek particularly the lower 0.3 miles. No coho have been seen in recent years (Egan 1978). Eelgrass beds lie offshore in the Jackson - Spencer Creek estuary and softshelled clams are known to exist in this area (Yoshinaka and Ellifrit 1974).

Economic and Recreational Resources: Spencer Creek provides a limited trout sport fishery and a moderate amount of chum salmon which contribute to sport and commercial fisheries in Hood Canal and Puget Sound.

The cove into which Spencer Creek empties contains a geoduck bed of minor sports harvest value lying in 27 to 37 feet of water at the mouth of the estuary (Goodwin 1978).

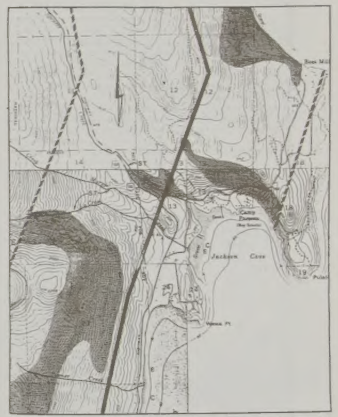


Figure 5. Spencer, Marple, Jackson and Turner Creeks. (Scale 1:24000)

The shoreline of Jackson Cove in general, including Spencer Estuary, is a herring spawning area. The waters of the cove are a shrimp fishing area (Division of Marine Land Management 1977).

## JACKSON - MARPLE CREEKS

Location: Jackson and Marple Creeks flow easterly across the pipeline corridor through Sections 14 and 13, Townships 27 North, Range 2 West, Willamette Meridian. The two creeks combine to form lower Marple Creek immediately west of the proposed pipeline crossing. The proposed pipeline crossing location is just east of the B.P.A. powerline in the northwest quarter of Section 13 (see Figure 5).

Observation Points: Jackson and Marple Creeks were observed from US 101, from a distance at the B.P.A. powerline, and at a county road crossing near the mouth.

Streambed: The streambed averages 6 feet wide. The bed is mostly composed of cobbles and small boulders.

Streambanks: Streambanks are 1 to 3 feet tall with an average slope of 3:1. Below U.S. Route 101 the stream has been channelized through a residential development.

Floodplain, Canyon, and Valley: The streambanks rise directly to an alluvial plain of varying width. Soils on the north canyon wall-slope are a red-brown, very gravelly, silty sand, or a loose, stoney, gravelly loam overlying a medium brown to red-brown gravelly silty sand subsoil. A sand and gravel pit is located north of the creek and east of the B.P.A. powerline.

Under the B.P.A. powerline there is ample evidence of sheet and minor gully erosion, likely due to poor, inadequate re-vegetation.

Biological Resources: Stream-side red alders provide a good to excellent stream canopy coverage above U.S. Route 101. Below U.S. 101 extensive clearing for residential development has stripped most stream-side vegetation.

A few chum salmon carcasses were lying in the creek bed near the mouth of the day of field inspection (21 January 1979).

Land Use Features: There are scattered residences along the shoreline. The remainder of the basin is in forestry uses.

### JACKSON AND MARPLE CREEKS
### ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: Both Jackson and Marple Creek are low canyon cuts into Green Hill. They have moderately steep sideslopes, approaching 30 percent in places and perhaps exceeding this in small scale topography. Stream gradients are very steep for both streams.

Soils and Erosion: The streambottom and floodplain is composed of Belfast fine sandy loam. Surrounding soils are mostly Grove very gravelly sandy loam and Grove very gravelly loamy sand (McCreary 1975). All soil types in the area are subject to moderate to severe erosion if exposed on steep slopes.

Vegetation: Vegetation in the Jackson - Marple Creek Valleys is not particularly sensitive, except on steep slope areas where re-vegetation may prove difficult.

Fish and Wildlife: Both Jackson and Marple Creeks support limited steelhead and searun cutthroat trout populations. Chum salmon and a small number of coho use the lower reaches of the creeks for spawning. The Jackson Cove Estuary resources have been discussed previously under Spencer - Jackson Cove Estuary.

Economic and Recreational Resources: The two creeks provide a limited trout sports fishery at the lower end. Salmon spawning investigations reveal that 80 to 120 chum spawn in the lower 0.1 mile of Jackson Creek annually and that less than 10 coho occupy this area annually. Fifty or more chum salmon are known to use the lower 0.5 miles of Marple Creek for spawning (Egan 1978). These salmon contribute to Hood Canal and Puget Sound fisheries.

### TURNER CREEK

Location: Turner Creek has its headwaters in the pipeline corridor and flows easterly through Section 23 and 26, Township 27 North, Range 2 West, Willamette Meridian.

Observation Points: Turner Creek was inspected in the vicinity of U.S. 101.

Streambed: The bed is 5 to 6 feet wide and is composed of a rough mixture of boulders, cobbles, and gravels.

Streambanks: The banks are 2 to 3 feet deep, rising at variable slopes (vertical to 300 percent).

Floodplain, Canyon, and Valley: Turner Creek is a shallow swale on the face of Green Hill. There is no true floodplain or canyon.

Creek Mouth: Turner Creek flows under U.S. Route 101 through a concrete culvert which cascades directly into Hood Canal. There is no delta or estuary.

Biological Resources: Pacific oyster shell mounds on the Hood Canal beach at the creek mouth are indicative of a substantial sports harvesting effort. No anadromous fisheries are expected to occur in the creek.

Land Use Features: Land use in the Turner Creek watershed is totally forestry uses.

### TURNER CREEK: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: Turner Creek has a relatively steep gradient, but low side slopes. The creek is basically a drainage swale on the side of Green Hill.

Soils and Erosion: The creek is within the Olympic National Forest boundary and soils have not been mapped. Due to the lack of stream canyon, erosion is not expected to be a particular problem here.

Vegetation: Streamside vegetation is not unusually sensitive.

Fish and Wildlife: The creek drains to a culvert which drops water into Hood Canal. No anadromous fish use is expected. A minor hardshell clam bed containing butter and littleneck clams lies

off-shore of the mouth of Turner Creek in 9 to 43 feet of water (Goodwin and Shaw 1978). The beaches along Hood Canal north and south of the mouth of Turner Creek are herring spawning areas (Division of Marine Lands Management 1977).

### DOSEWALLIPS RIVER

Location: The portion of the Dosewallips River within the pipeline corridor is located within Sections 33 and 34 of Township 26 North, Range 2 West and Sections 2 and 3 of Township 25 North, Range 2 West, Willamette Meridian. The BPA powerline and the proposed pipeline route cross the river approximately one mile above its mouth.

Observation Points: The Dosewallips River was investigated along 3 portions of the pipeline corridor, in addition to the proposed crossing point, immediately west of the BPA powerline right-of-way (located roughly one mile from the river mouth). A one-half mile long stretch of the river upstream from the proposed crossing was waded in order to determine riverbottom characteristics in detail. A point ½ mile below the powerline near Brinnon was also investigated and a ½ mile long segment near the river mouth in Dosewallips State Park was waded.

Streambed: Within the 2 mile corridor, river flow characteristics vary sharply due to variable gradient and channel width. The upper reaches of the corridor are divided into runs, riffles and pools, with riffles occupying 40 percent, runs 40 percent and pools 20 percent or less. In run areas, stream depth was 8 to 24 inches and the velocity was typically 4 to 6 feet per second, but ranging up to 12 to 18 feet per second in a few narrow channels. Riffle areas occur where depth is less than 8 inches or where larger rocks protrude. The riffles are typically found near gravel bars and at bends in the river. Pools are up to 5 to 6 feet deep. Overall channel width is roughly 60 feet, although gravel bars tend to constrict this in many places. Average depth is 12 inches and maximum depth 24 inches in run-riffle sections.

The river seems to carry a high nutrient load in the autumn of fallen deciduous leaves and twigs, due to the prevalence of overhanging riverbank vegetation. This organic matter tends to become trapped among the gravels in the riffle areas. The streambed substrate is medium cobbles (½ to 12 inches) mixed with deposited fine gravels and sand. Small gravels are present in patches.

Streambanks: Since the river meanders up to the valley sidewall, riverbanks vary from low banks on the floodplain side to steep valley cliffs. The lower banks vary from 2 to 8 feet tall and are generally on the north side of the river above the BPA powerline. Bank substrate is a brown-black silt loam. The southside banks form a washed away vertical cliff more than 40 feet in height in many places. Substrate was observed to be a series of coarse brown sand strata, occasionally mixed with cobble layers, underlain by a 15 to 20 foot layer of grey clay. All of these materials appear to be highly erosional, and undercutting and fallen trees are prevalent.

Toward the river mouth banks are lower (2 to 5 feet) and more gently sloped. The river broadens somewhat (80 to 100 feet wide) as it nears the estuary and the banks become laced with side channels and sloughs.

Floodplain and Valley: The main floodplain is contained between the banks and varies from 50 to 100 feet in width with the main stream channel being a 25 foot wide meander between gravel bars. Above the river banks, the valley floor (½ mile or more wide) forms the floodplain for exceptional floods. The valley is basically U-shaped with steep walls mostly on the south side up to 100 feet in height. Large hills and small mountains (1000 to 3000 feet) rise to both the north and south.

Biological Resources: The riverbank vegetation is mainly red alder with scattered western red cedar, big leaved maples and black cottonwoods. Douglas fir trees occur in the upland areas. The forest understory is mostly salmonberry and snowberry, mixed with ferns. Near the river mouth, the forest becomes a less diverse alder bottom community dominated with alder. These trees gradually become smaller in height as they become closer to the estuary and are eventually mixed with estuarine and marsh grasses before giving way to tidal marsh.

No fish were observed during fieldwork, although the numerous gravel beds undoubtedly provide spawning areas for anadromous fish. Shells were observed in the reach near the river mouth, indicating that clams and mussels are present (see Dosewallips Estuary). Near the river mouth, waterfowl, gulls and other birds became quite prevalent. Birds observed included dippers (water ousel), pine siskin (large flock), merganser, belted Kingfisher, mallards and widgeon. Evidently the lower river mouth and estuary provides

considerable fish resources and vegetable matter for these birds' food supply, even in November and December.

Land Use Features: The valley is mostly in residential use or small farms. At the mouth, Dosewallips State Park provides a major recreation and fishing area.

### DOSEWALLIPS RIVER: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The Dosewallips river forms a narrow valley floodplain among the Olympic foothills, which range up to 1500 to 2500 feet in elevation to the north and south. At the proposed crossing, slopes are greater than 30 percent. To the west, other portions of the river are lined with steep cliffs on the south side. There are areas, however, with more gradual slopes (see Figure 6).

Soils and Erosion: The floodplain soils are Belfast fine sandy loams and river gravels. The soils on the steep hill to the south are Grove very gravelly loamy sand with Hoodsport and Triton Soils on the surrounding upland terraces. The Grove soils are highly permeable and are erosive in steep areas (McCreary 1975). High volumes of subsurface water are probable in this area.

Vegetation: The riverine vegetation is typical for western Hood Canal and not particularly sensitive. The riparian vegetation does provide important bank sheltering habitat in some areas.

Fish and Wildlife: The Dosewallips river supports important runs of both steelhead and searun cutthroat trout. In addition, four types of salmon, chum, chinook, pink and coho, use the river for spawning. Peak chum counts generally range from densitites of a few hundred to a thousand fish per mile in the lower six miles of river. Chinook densities are low, usually 10 to 20 fish per mile. Coho levels have occasionally risen to several hundred fish, but have been low in recent years. The river does support a large run of pink salmon. Levels of pink salmon spawning in the Dosewallips peaked between 10,000 and 20,000 fish per mile in the 1960's, with peaks of several thousand being common in other years.

Economic and Recreational Resources: The Dosewallips River supports a major sport fishery. Dosewallips State Park is often filled with considerable numbers of sports fishermen. Additionally, the river is responsible for one of Puget Sound's major pink salmon runs.

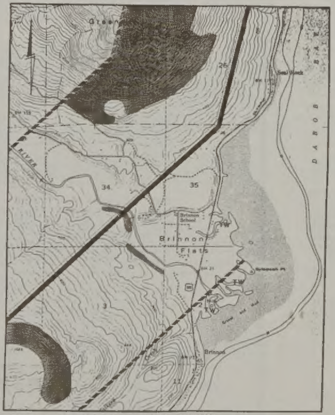


Figure 6. Dosewallips River. (Scale 1:24000)

### DOSEWALLIPS RIVER ESTUARY

Location: The Dosewallips Estuary is located in Section 2 of Township 25 North, Range 2 West, Willamette Meridian. It is approximately 1 mile southeast of the proposed pipeline crossing.

Observation Points: The river mouth opens gradually from an alder bottomland into a slough system among salt marsh islands. The river mouth section was waded and several of the main saltmarsh islands were inspected in detail.

Streambed: The sloughs are generally 10 to 15 feet wide with the main river channel over 50 feet wide. The substrate is a grey-brown silt, still mixed with cobbles from the river in places. The marsh substrate is a black peat which forms steep sides to the sloughs.

Tideflats and Wetlands: The wetlands form a wide saltmarsh extending roughly a quarter mile from the uplands to open water and possibly ½ mile in lateral extent. The swamp bottomland of the river grades into the marsh as the trees become more sparse. High and low marsh zones are present as described more fully under Biological Resources.

Geomorphology: The river mouth broadens into meadering sloughs forming several isolated spits and salt marsh islands. Hood Canal water infiltrates the entire slough section on incoming tides. The area is thus a brackish estuary during most tidal conditions. The Dosewallips marshes form one of the five main tidal marshes along the west side of Hood Canal.

Biological Resources: The high marsh is dominated with aster (Aster suspicatus), silverweed (Potentilla) and several grasses (Deschampsia, Agrostis). The lower marsh is a diverse mixture of rush (Juncus maratima), sedge (Carex spp.), saltgrass (Distichlis spicata), arrowgrass (Triglochin spp.) and pickleweed (Salicornia virginica). The intertidal zone contains sedges, pickleweed and the brown alga,

Fucus.

Several waterfowl, including merganser, widgeon and mallards, were present, as well as glaucous-winged gulls, belted kingfisher and other waterbirds. A local fisherman reported catching several steelhead near the river mouth. The sloughs undoubtedly provide protected areas and rearing areas for anadromous fish using the river and other fish and shellfish of Hood Canal.

Land Use Features: The estuary is located within Dosewallips State Park, a major public recreation and sports fishing area.

### DOSEWALLIPS ESTUARY: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The Dosewallips Estuary is a level tidal marsh cut by many stream channels and guts.

Soils and Erosion: The tidal marsh soils are defined as Belfast and Lummi silt loams in the upper marsh and as tidal marsh on the lower marsh area and mudflats. These soils are subject to tidal or scour erosion.

Vegetation: The estuarine vegetation is of a highly diverse tidal marsh community. The wetland vegetation present would be significantly damaged by massive sediment depostions or oil leakage from upriver. The damage would be magnified in terms of its effects on the associated marsh fauna.

Fish and Wildlife: The Dosewallips estuary supports eelgrass beds and is well-used by waterfowl (Yoshinaka and Ellifrit 1974). Steelhead, salmon and searun cutthroat trout utilize the tidal marshes for rearing habitat. In addition, chum salmon spawn in these areas. The Dosewallips delta also provides a major haulout area for harbor seals on Hood Canal. Peak counts of 160 seals were noted in 1977 (Calambokidis 1978).

Beds of softshelled clams and geoducks can be found within ½ mile of the estuary shoreline. The softshelled clams and geoducks are harvested for sports purposes. The geoduck bed is estimated at 108 acres containing 867,192 clams, a moderate density for a major bed (Goodwin 1978). Shrimp and crabs are also present in the estuary and provide sports harvest. One commercial oyster harvesting area occurs outside of the estuary in Hood Canal.

Economic and Recreational Resources: Sportsfishing and Public Recreation occurs at the estuary, due to high fish populations and the access provided by Dosewallips State Park. Clam harvesting for sports purposes also occurs.

## DUCKABUSH RIVER

Location: The portion of the Duckabush River within the pipeline corridor is located in Sections 16, 17 and 21 of Township 25 North, Range 2 West, Willamette Meridian. The proposed pipeline route crosses the river approximately one mile above its mouth.

Observation Points: The Duckabush river was observed from three main points: at roughly ½ mile above the BPA powerline, overlooking the river from the powerline, and at the U.S. 101 Highway Bridge near the mouth. Additionally the tidal marsh estuary was investigated in detail. (See Duckabush Estuary data sheet.)

Streambed: The Duckabush River is a lower gradient river with a broader floodplain than most of the other Hood Canal tributaries. The river has a well-developed system of branching channels throughout most of the forested islands between the channels. At the observation point ½ mile above the power line, the main channel was generally 25 to 30 feet wide with one or two 10 to 15 foot wide side channels, bringing total river width to 40 to 50 feet. The river is mostly braided run and riffle areas with maximum depths of 1 to 2 feet. Some of the deeper run areas may be interpreted as shallow pools. Currents ranged from 7 to 10 feet per second in constricted areas, with slower velocities (3 to 6 feet per second) in the riffles. Total flow was estimated at 150 to 200 cfs. Bottom substrate is a mix of small cobbles and coarse gravels.

Streambeds: The streambanks are generally low (2 to 4 feet) and moderately sloping (50 to 100 percent slopes) in the upper reach of the corridor. Near the mouth, the banks rise in places to 10 to 15 feet, diminishing again as the river enters Hood Canal.

Floodplain and Canyon: The floodplain is roughly ¼ mile broad between sharply sloping canyon hillsides. The canyon walls are steep hillsides in general, not vertical cliffs. The floodplain is a moist, swamplike bottomland which is apparently flooded with considerable frequency.

Biological Resources: The floodplain is forested by a mixed stand of old growth red alder, western red cedar, bigleaved maple and willow. Brush is sparse with salmonberry and ferns predominating. Wetsoil groundcover species such as mosses are also prevalent. No fish or wildlife were directly observed in the upper portion of the river. However, the gravels would provide good spawning areas for anadromous fish. Salmon were seen swimming near the river mouth.

Land Use Features: Country residences and small farms dot the upper valley, but few are on the valley floor. The floodplain is mostly forested.

## DUCKABUSH RIVER: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The Duckabush forms a narrow river valley between foothills of the Olympic Mountains. The floodplain is a rather broad, flat expanse with slopes often greater than 30 percent rising toward the north and south. Steepslopes exist at the pipeline crossing on both the north and south valley walls (see Figure 7).

Soils and Erosion: River valley soils are Belfast silt loams. Surrounding soils on the valley walls are Lystair find sandy loam, grove very gravelly loamy sand and Hoodsport very gravelly sandy loam, along with more minor soil types (McCreary 1975). The silt loams are very compressible and subject to scour erosion. The sands and gravels are subject to moderate erosion if exposed.

Vegetation: The floodplain of the Duckabush estuary forms a riverine wetland. This is one of the few Hood Canal riverine wetland communities, and the only significant one in Jefferson County. The wetland associations present would be moderately susceptible to damage from sedimentation and oil leakage.

Fish and Wildlife: The Duckabush River support major natural runs of steelhead and searun cutthroat trout. In addition, chum, coho, chinook and pink salmon spawn in the stream with pink and chum ultilizing the lower three river miles and fall chinook spawning up to River Mile 7.0. Chum densities of 500 to 2000 fish per mile are not uncommon in the lower river and pink densities are often in the 2000 to 10,000 fish per mile range.

Economic and Recreational Resources: The steelhead and cutthroat trout provide the major sports fishery on the river. Salmon which ultilize the Duckabush contribute heavily to commercial and sports salmon fisheries on Puget Sound.

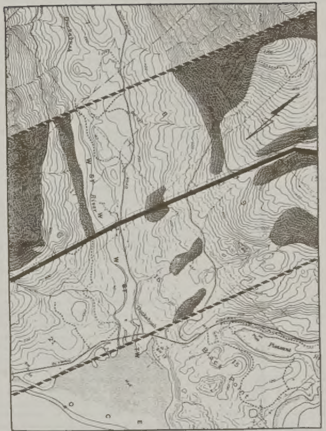


Figure 7. Duckabush River and Estuary. (Scale 1:24000)

## DUCKABUSH RIVER ESTUARY

Location: The Duckabush River Estuary is comprised of the brackish lower reach of the Duckabush River and the tidal flats at the river mouth. It occupies portions of Sections 16 and 21, Township 25 North, Range 2 West, Willamette Meridian. The proposed pipeline crossing is one mile above the tidal flats and within ½ mile of the upper reaches of the brackish estuary.

Observation Points: The estuary was observed from the U.S. Route 101 Highway Bridge as well as from several points on the salt marsh.

Streambed: The streambed in the river channel is composed of gravels in a silt matrix. The banks diminish in height to 2 to 4 feet as the river enters the marsh area around its mouth.

Tideflats and Wetlands: A saltmarsh fringes the river mouth and nearby Hood Canal shorelines. The marsh is mainly composed of sedges and grasses, grading into dryer meadowlike areas adjacent to the uplands and roadbanks. A limited region of bare tidal flats is also present at the outer wetland edge.

Geomorphology: The Duckabush Estuary extends at least ½ mile upriver of the mouth due to the low gradient and slow flow of the stream. Considerable salt influence was detected above the U.S. Route 101 Highway Bridge on an outgoing tide. Thus the lower reach of the river is partially influenced by Hood Canal marine waters. The river maintains a straight channel until it intersects Hood Canal.

Biological Resources: The marsh flats at the mouth of the Duckabush are composed of aster (Aster suspicatus), yarrow (Acheillia millefollium), bentgrass (Agrostis spp.) and silverweed (Potentilla pacifica) in the upper marsh and saltgrass (Distichlis spicata) and sedges (Carex lyngbyei) in the lower marsh. The marsh is several hundred feet in width from the shore to Hood Canal and over a thousand feet in lateral extent along the shoreline.

Waterbirds, including gulls and a belted kingfisher, were observed near the river's mouth. Some waterfowl probably use the marsh during migration times. Salmon were observed in the lower reach of the river, as were oysters, clams and other shellfish.

Land Use Features: Scattered residences and small farms occur to the north and south of the river mouth.

## DUCKABUSH ESTUARY: ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The estuary is a flat tidal marsh, cut by numerous winding channels.

Soils and Erosion: The estuarine soils are soft tidal marsh sediments composed of silt and peat. These soils are subject to erosion from tidal action or river scour.

Vegetation: The Duckabush Estuary contains a substantial tidal marsh, fringed by extensive mudflats. The tidal marsh is a sensitive wetland community which could be significantly impacted by massive sediment deposition or oil leakage.

Fish and Wildlife Resources: The Duckabush Estuary has moderate waterfowl use of the marsh and offshore eelgrass beds (Yoshinaka and Ellifrit 1974). The delta also provides a major haulout for harbor seals. Peak seal levels were recorded at 163 here in 1977 (Calambokidis 1978).

Fish utilizate the estuary for rearing, including both trout and the four salmon varieties found in the river. Chum and pink salmon also use the estuary for spawning.

There is a minor geoduck bed off-shore of the delta in 30 to 60 feet of water. Crabs and shrimp are also harvested in the estuary. A commercial oyster culture bed is also present off-shore.

Economic and Recreational Resources: The estuary of the Duckabush extends nearly a mile upstream of the mouth. The estuary, therefore, provides sport fishing in addition to that provided by the river. Searun cutthroat and steelhead provide the main sport fishery resource. The salmon in the Duckabush estuary contribute significantly to Puget Sound commercial fisheries, as well as to off-shore sports harvest in Hood Canal. Shrimp, crabs and clams are also harvested for sports purposes.

## MC DONALD CREEK

Location: McDonald Creek has its headwaters in the pipeline corridor, and flows southeasterly across Sections 19, 30, and 29, Township 25 North, Range 2 West, Willamette Meridian. The tentative pipeline crossing location is immediately southeast of the B.P.A. powerline in the northwest quarter of Section 29.

Observation Points: McDonald Creek was walked from its mouth at U.S. Route 101 up to River Mile 0.1.

Streambed: The streambed is 18 to 27 feet wide with a main stream thread 6 to 18 feet wide. The substrate is gravel with a 90% coverage of cobbles and small boulders.

Streambanks: Streambanks average two feet deep.

Floodplain, Canyon, and Valley: McDonald Creek, where inspected, meanders across the north side of an alluvial plain from which rise canyon slopes. The canyon bottom plain is approximately 120 feet wide and extends upstream at least one eighth of a mile.

Canyon slopes near the the mouth are a mat of mosses and ferns directly covering recently fractured basaltic parent material. Few trees grow on the slopes, mostly bigleaf maple and western redcedar. The undergrowth of sword fern and vine maple is dense in patches.

Biological Resources: At a time (21 Janauary 1979) when most other Hood Canal creeks and rivers had chum salmon carcasses lying in lower streambeds, none were found in McDonald Creek.

Land Use Features: All land along the creek is forested.

## MC DANIEL COVE

Location: Mc Daniel Cove, the mouth of McDonald Creek, is in the northeast quarter of Section 29, Township 25 North, Range 2 West, Willamette Meridian.

Observation Points: The shoreline was walked at the head of the cove.

Tideflats and Wetlands: McDaniel Cove has only fringe tidal marshes along portion of the upper beach. The intertidal flats cover approximately 7 to 8 acres.

Biological Resources: No detailed survey of the tidal wetlands was carried out.

Land Use Features: The south shore of the cove was formerly used for commercial enterprises.

## MC DONALD CREEK AND MC DANIEL COVE
## ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: McDonald Creek forms a relatively steep canyon rising from a 120 foot wide creek floodplain. Slopes are generally in excess of 30 percent, except in the western portion of the pipeline corridor (see Figure 8).

Soils and Erosion: Floodplain soils are predominatly Grove very gravelly loamy sand. Valley wall soils are also of the Grove series. These soils are subject to erosion on steep slopes, particularly if exposed (McCreary 1975).

Vegetation: Streamside vegetation is not particularly sensitive. Valley wall vegetation may be difficult to re-establish following construction due to steep slope and poor surface soils.

Fish and Wildlife: McDonald Creek and McDaniel Cove are thought to be used by steelhead and cutthroat trout (Yoshinaka and Ellifrit 1974). Chum salmon may use the lower creek; however, recent investigations have shown that salmon use is apparently declining (Egan 1978). McDaniel Cove contains moderate densities of butter and native littleneck clams and high densities of Japanese littleneck clams.

Economic and Recreational Resources: The creek provides a limited sport fishery. The cove provides abundant softshelled clam resources for sports harvest.

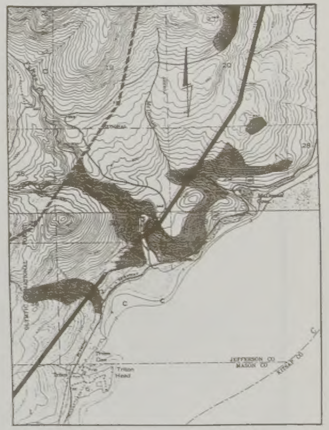


Figure 8. McDonald and Fulton Creeks. (Scale 1:24000)

## FULTON CREEK

Location: Fulton Creek flows southeasterly through the pipeline corridor in Sections 30 and 31, Township 27 North, Range 2 West, Willamette Meridian. The tentative pipeline crossing is immediately southeast of the B.P.A. powerline in the southeast quarter of Section 30.

Observation Points: Fulton Creek was observed from the U.S. Route 101 bridge.

Streambed: Fulton Creek is a meandering stream with a highly variable bed width which averages approximately 60 feet. Substrate is a gravelly sand under a 30% coverage of cobbles.

Streambanks: Typical of meandering streams, erosional banks are relatively steep (30 to 100 percent slope), and accretional banks are relatively flat (3 to 5 percent slope).

L-15 CONT

Floodplain, Canyon and Valley: Fulton Creek meanders through the center of an alluvial plain which is approximately 300 to 400 feet broad near its mouth. Up-stream, the plain narrows to 100 to 200 feet wide at the B.P.A. powerline.

Biological Resources: Where natural vegetation remains on the alluvial plain, red alder and willow thickets predominate. The remainder of the plain has been cleared for residential and recreational development.

Copious amounts of filamentous green alagae are attached to stream cobbles in the lower 400 to 500 feet of the creek.

Few chum salmon carcasses were lying on the streambottom at a time (21 January 1979) when many other streams exhibited large numbers of salmon.

Land Use Features: The north canyon slopes and plateau have been developed for seasonal residences. Forestry is the predominant land use in the area.

## FULTON CREEK DELTA

Location: The Fulton Creek delta protrudes into Hood Canal offshore of the northeast quarter of Section 31, Township 27 North, Range 2 West, Willamette Meridian.

Observation Points: The delta was observed from the U.S. Route 101 bridge.

Tideflats and Wetlands: There are no tidal marshes of any consequence along the Fulton Creek delta. The intertidal flats cover approximately 30 to 35 acres.

Biological Resources: Pacific oyster shell mounds on the delta beach are indicative of a substantial sport fishery. (Access is limited to property owners in the adjacent land development on the north side of Fulton Creek.)

Land Use Features: The delta shoreline is a private recreational preserve.

## FULTON CREEK AND FULTON CREEK DELTA
## ENVIRONMENTALLY AND ECONOMICALLY SENSITIVE AREAS

Slopes and Topography: The Fulton Creek drainage has extremely steep side slopes rising 400 feet above the floodplain in places. These slopes are well over 30 percent in most places. The stream gradient is also relatively steep. South of the creek, the pipeline passes through a geologically unstable area (Jefferson County 1978).

Soils and Erosion: The stream floodplain soils are Triton very gravelly loam in the upper basin with Hoodsport very gravelly sandy loam and Belfast silt loam in the lower part of the corridor. Sideslope soils are mainly Grove very gravelly loamy sand. The sideslope soils can be expected to be extremely erosive on the steep areas bordering Fulton Creek (McCreary 1975).

Vegetation: The streamside vegetation is not overly sensitive. Vegetation on the steep sideslopes, however, may be difficult to re-establish following construction activities.

Fish and Wildlife: The stream supports a steelhead and cutthroat trout spawning run in addition to coho and chum salmon (Yoshinaka and Ellifrit 1974, Williams et al. 1977). Chum densities often range from 100 to 800 fish per mile during peak spawning periods. Butter and native littleneck hardshell clams are present off the Fulton Creek Delta.

Economic and Recreational Resources: Trout runs provide a moderate sports fishery in the creek. A major subtidal clam bed cover 54 acres off the creek mouth. Estimated clam resources include 3,229,000 pounds of butter clams, 24,000 pounds of littleneck clams and 330,000 pounds of horseclams.

## III. POTENTIAL IMPACTS

Potential impacts of the proposed Northern Tier Oil Pipeline to physical and biological resources are divided here into two categories:

- construction impacts
- operational impacts

Construction impacts are discussed in the context of direct effects on the river crossing and sideslope construction within the basin. Operational impacts result basically from system malfunctions which cause oil leakage, either beneath the ground or beneath the river.

CONT

### CONSTRUCTION EFFECTS

### Construction Methods

According to the EFSEC Application, Northern Tier intends to cross all major and minor streams with a buried 42" diameter pipeline under the stream bottom. The top of the pipe would be placed at least 48" below a 100 year flood scour depth. Stream trenching would be accomplished by dredging with a backhoe, dragline or clamshell, either in the water or on-shore. Material taken from the trench will be left in the river until replaced over the pipe. Streams with sandy bottoms and subsurface water may be dewatered during construction. The presence of bedrock may necessitate blasting.

Trenching on river valley slopes will be accomplished by trenching machinery or blasting as necessary. The trenches will be backfilled with the native material and compacted as necessary.

Construction is expected to occupy the period April - November 1980. However, if the permit process is faster or slower than expected, Northern Tier may start earlier in 1980 or continue into early 1981.

### Water Diversion or Blockage

The construction procedures envisioned by Northern Tier are not stream specific. Apparently all river crossings in Jefferson County are to use below-ground burial. This will result in possible river blockage by:

- construction equipment
- portions of pipeline
- dredged material

In the smaller streams particularly, any blockage will increase water velocity and consequently scour of banks.

There is also apparently a possibility that streams with subsurface water will be diverted from their course or dewatered into point wells. Such dewatering will obviously expose downstream spawning gravels, kill downstream aquatic plants, fish and shellfish, and impact mammals which use the stream basin. Any dewatering or increase in stream velocity in spawning periods or during egg incubation will have a serious effect on anadromous fish. Dewatering may also effect downstream shellfish by raising estuarine salinity and altering habitat now used by brackish water species such as oysters.

### Erosion and Stream Siltation

By far the greater construction impacts on the streams and river relates to erosion and siltation. Several of the canyons including Salmon Creek, Jackson Creek and Spencer Creek are narrow, V-shaped canyons with little or no room for construction equipment at the bottom. In these areas one can expect the following:

- larger than normal cuts and fills down the canyon sides
- extra road system winding down bank to accomodate heavy equipment
- erosion of trench material from canyon sides throughout construction
- potential liquidation, erosion and slippage of backfill material following construction
- lack of space to stockpile dredged material will result in channel diversion, bank erosion and high siltation from dredge spoils left in the stream

Many of the slopes in these V-canyons range from 30 to 50 percent to over 100 percent. In places the walls are nearly vertical. This canyon shape results from rapid cutting action by the streams over a relatively short geologic time period. The soils associated with V-canyons are thus highly erodable with crumbling and potentially unstable banks. Failure of revegetation efforts in these areas is likely. Such failure will continue erosion for many years after construction is completed.

Other rivers such as the Big Quilcene, Dosewallips and the Duckabush contain steepsided cliffs adjacent to one side of the river, or steep banks leading to the river floodplain. If the Big Quilcene is crossed at the proposed point, this will cause little problem. At the Dosewallips, steep hillsides south of the crossing will result in some of the trenching problems described above for V-canyons. On the Duckabush, the steep hillsides lead directly to a floodplain containing freshwater swamp wetlands. These wetlands are intimately connected with the river and large amounts of construction sediment will likely be resuspended and carried down the river during high water periods.

The ultimate biological effects of siltation depend on the stream and receiving waters. Sediments can cover or destroy gravel spawning beds by filling spaces and covering the gravels. During egg incubation, this effect would drastically reduce fish escapement.

CONT

Earlier in the year, it might prevent successful spawning.

In the lower stream, sediment can be expected to precipitate out, clogging lower channels, raising flood levels, and burying some wetland and shellfish resources. It is expected that the effects of sediment on wetlands would only be temporary; however, filter-feeding shellfish might be more severely affected, particularly oyster spat. Sight feeding fish such as salmon and trout would also have their efficiency impaired. This might be particularly important for juvenile salmon rearing in the tidal wetlands.

### Other Water Quality Effects

In addition to increasing turbidity and suspended solids through dredging and trenching, other water quality degradation can be expected. Vehicle leakage of oil and gasoline can be expected. This may be minor in most cases, but should be considered.

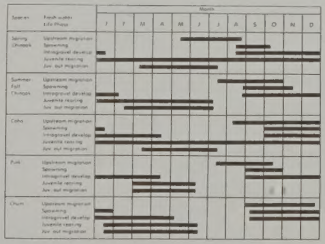
### Construction Timing

Construction timing as proposed by Northern Tier is rather vague and is only loosely tied to biological considerations. Nearly all times of year pose some problems, either for engineering or for biological organisms. The ideal times for ease of construction are low-flow periods in the late summer and early fall. Unfortunately, this period coincides with anadromous fish spawning in some species. Anadromous salmon spawning periods for the Olympic basins are shown in Table 8. Chinook and pink salmon begin spawning during July and August. Chum begin in September and coho spawn from October through the winter months. Some of the species collect at the lower end of the smaller streams and wait until water levels rise in the fall to migrate upstream. Hatching generally occurs during the late winter for most species; however, fry do not emerge from the gravels to begin their saltwater migration until April or May. Thus late May, June and early July are the only months during which there is little salmon use of the freshwater areas (Williams, et al. 1975, Scott and Crossman 1973). In the cases where a river or stream enters a tidal wetland or estuary, juvenile salmon school in the marshes for several months during late spring and summer before they migrate seaward. During these months, low flow conditions would limit dilution of sediment or other pollutant concentrations and could affect successful rearing of the juvenile salmon. Thus, in rivers with estuaries or substantial tidal marsh, there is no "good" time to degrade water quality. The months of May, June and July, however, would probably be the best.

Effects of increase sediment on spat set of oysters or filter feeding by shellfish are less well studied, but should be defined before construction schedules are finalized.

Table 8

TIMING OF SALMON FRESH-WATER LIFE PHASES
IN THE QUILCENE AND NEARBY OLYMPIC BASINS



Source: Williams et al. 1977.

### OPERATIONAL EFFECTS

### Pipeline Operation and Oil Properties

The pipeline will be equipped with automatic pressure monitoring systems and check and block valves. Valves to halt major spills will be installed on both sides of major stream crossings and can be activated within 10 minutes, remotely. The maximum anticipated acute spill is 57,000 barrels. Pressure drop valves are capable of sensing 0.5 percent pressure drops; however, a small leak could theoretically go on indefinitely until observed on the ground or by periodic aerial reconnaissance. One way valves at valley bottoms will also reduce the risk of backflow along the pipe in case of a break.

CONT

The crude oil expected to be transported by the pipeline has a specific gravity of roughly 0.9 (water = 1.0) and will tend to float. Some fractions, however, have higher specific gravities. After a spill or leakage, oil released to the streams will separate with most of the hydrocarbons floating and some fractions settling along the bottom.

### Acute Spills

Acute oil spills could come about through the rupture of a surface valve, sudden rupture or explosion within the pipe, or as a result of earth movement in the vicinity. The Olympic Mountains are a young and building mountain chain where earthquakes and unstable earth conditions are common. Any pipeline breakage is estimated to release less than 57,000 barrels of oil into the area surrounding the break. In most of the terrain surrounding the pipeline, breaks at the river crossing or the nearby slopes would rapidly drain major amounts of oil into the river, lake or stream. Based on observed stream velocities of 2 to 6 feet per second (1 to 4 miles per hour), floatable materials from a pipeline rupture approximately one mile above the receiving water would reach the estuary in 15 to 60 minutes. Tidal wetlands and shellfish beds would be affected long before any response team could begin isolation and cleanup procedures.

Salmon and trout spawning gravels would be covered with the tars and heavier hydrocarbon fractions. Floodplains and riverine wetlands would be inundated if the break occurred during high water.

Upon reaching the estuary, tidal action would tend to spread the oil throughout tidal marshes, seriously damaging waterfowl, coating and eventually destroying most plant productivity, damaging rearing areas for anadromous fish, and clogging intertidal shellfish beds. The literature is replete with studies of damaging effects of oil spills on salt marshes in England, France and the eastern U. S. coast.

As Northern Tier points out, the likelihood of a major spill is low. Be that as it may, the damage of such a spill on a major estuarine system such as the Salmon-Snow, Quilcene, Dosewallips, Duckabush or Fulton Creek would be to completely destroy mammal, waterfowl, fish, shellfish, vegetation and commercial and recreational uses of that area for many years, as well as potential effects on Hood Canal in general. The canal and its bays are poorly flushed with many nearshore eddy currents. The contamination of one estuary might also result in effects on nearby estuaries and bays.

### Chronic Spills

While acute spills usually gain headlines and public awareness, low-level chronic leakages or pollutant discharges usually result in more widespread and lasting damage. Low levels of oil leakage could remain undetected for long periods of time and result in subtle changes in survival and reproduction for mammals, birds, fish and shellfish which utilise the streams and estuaries. Clogging of gills or filtering apparatus, introduction of toxic benzene derivatives, induction of sub-lethal tumors and effects on spat survival or hatching success are all potential sub-lethal effects which can be introduced by hydrocarbons and associated compounds. These effects are difficult to study under field conditions, but have been documented under laboratory conditions. It is important to realize that chronic, low level leakages can potentially cause such effects.

## IV. POSSIBLE MITIGATIVE CONSTRUCTION OR ALIGNMENT MEASURES

This section begins with a discussion of ways to improve the proposed alignment at stream crossings. It should be pointed out, however, that the alignment may be improved significantly and still have major adverse effects. For this section only, we assume that the Eastern Olympic Peninsula route must be maintained, and carry out analyses to provide suggestions for better alignment. Such suggestions should not be taken in the context of absolute recommendations, since the fieldwork done in this study is not sufficient for such surety.

### Crossing Alignment

*Salmon Creek* - The proposed crossing occurs in a steep V-canyon at the BPA power line. Alignments which would improve this to some extent might be to swing the pipeline south or east roughly 1/2 mile before the stream crossing. In this way, the pipeline could be brought:

- (east) across a relatively level plateau at the headwaters of the North Fork of Salmon Creek
- (south) across a main channel of Salmon Creek in a broader and less steep stream valley.

*Snow Creek* - There are no apparent problems with the proposed alignment.

*Lakes* - Nothing short of major route changes can be done about the fact that the pipeline passes through those lake basins.

L-15 CONT

*Big and Little Quilcene Rivers* - The main alignment problems here are that the crossings are near the estuary. Construction will be easiest in this area, however. South of the Big Quilcene, the pipeline passes through unstable, steep slope areas above Quilcene Bay. There is not presently enough information to suggest alternate routing; however, this should be explored more thoroughly in terms of possible major realignments.

*Spencer, Jackson and Marple Creeks* - An alignment change making a loop toward the west beginning north of Spencer Creek and re-entering the main corridor south of Jackson Creek should be explored. Alternatively, crossing the V-canyons with elevated pipe structures could be tried.

*Turner Creek* - The proposed alignment poses no significant problems.

*Dosewallips River* - The proposed alignment climbs a steep bank near to the river on the south side. A shift upstream 0.1 to 0.2 miles will yield more room in the floodplain for soils disposal and equipment operation.

*Duckabush River* - The proposed alignment passes through the riverine wetland and climbs a steep bank to the south. An alignment shift 0.2 to 0.3 miles to the east will lessen the bank grades; however, all alignments will pass through sensitive wetland or estuarine areas.

*Mc Donald Creek* - Re-routing the pipeline 0.2 - 0.3 miles to the west would avoid some of the steepest slope areas. Alternatively an elevated construction technique might be used.

*Fulton Creek* - The creek canyon is very steep and there are no good crossing points. Elevated construction is the only possible realignment possibility within the corridor.

## Construction Options

It is the responsibility of Northern Tier to provide detailed design of alternatives and construction options. Based on field observations and data gathered for this report, however, some general categories of mitigative measures can be pointed out. Their ultimate usefulness will require further design work and study, and applicability to particular streams.

The most significant construction impacts will be caused from erosion and dredging. These impacts can be reduced in steep-sided V-canyons with:

- trestles over river beds
- trestles over narrow canyons

Bridge or trestle construction can reduce the problems with backfill and re-vegetation of steep areas, lessen erosion, and eliminate the need to dredge or fill in streams. It will also slightly reduce energy required for pumping, although it may prove more costly than sub-channel burial.

In trestle areas, an interceptor pipe surrounding the main pipe could be used to direct any oil leakage back to holding ponds outside of the river floodplain.

If subchannel burial must be used on some streams, use of check dams made of non-erodable material could provide a means of dry trenching without completely dewatering the stream or river.

If wet trenching is carried out, spoils piles should be created alongside the stream in an area where the material will not re-enter the stream until replaced. Dredged material should not be left in the stream bottom. Other erosion control methods (hay bales, netting, etc.) should be used on any bare areas to be exposed for extended periods. Over-winter contorl measures, in particular, should be specified in detail by Northern Tier.

## Revegetation

Revegetation will be difficult in poor soils and steeply sloped areas. Revegetation in such areas should include:

- careful soil preparation
- appropriate selection of soil holding species known to survive well in poor soils
- post revegetation inspection to monitor survival and erosion

Revegetation will be facilitated if the pipeline route can be closed to recreational motorists (4-wheeled drive vehicles and motorcycles). Barriers should be erected at all major road crossings to discourage such use. Such barriers could not be expected to effectively prohibit all ATV's and some surface disruption and enhanced erosion would none-the-less occur. Herbicide spray programs should be carefully controlled or banned entirely. Such management practices increase erosion and degrade water quality in receiving waters.

## Timing of Construction

Construction on important anadromous fish streams should be carried out only in late May, June and July. This may stretch pipeline construction over a 2-year period, in which event careful revegetation should be carried out at the end of each construction period.

CONT

## Permitting and Construction Control

Detailed plans for stream crossing alignment and construction techniques should be required on all streams. Water quality and erosion control methods to be used should be documented in detail. If possible, Corps of Engineer Permits should be required on all streams defined as having potential hazards in this report. Additionally, all construction should be supervised directly by personnel from federal and state fish and wildlife agencies.

In particular, Northern Tier should be required to unequivocally commit themselves to adopting a construction schedule approved by specific agencies: the Washington Department of Fisheries, the Washington Department of Game, and the U.S. Fish and Wildlife Service.

## Reimbursement for Damages

A fund and mechanism for damage repayment should be set up at a state or regional level. Such a fund would be responsible to counties, cities or private landowners who suffer operational damages from spills. Such a fund should be administered by a neutral, disinterested party or agency to prevent abuses.

## V. EVALUATIONS AND RECOMMENDATIONS

The proceeding sections have demonstrated that the area along the proposed pipeline route:

- has valuable resources of importance to Jefferson County.
- is susceptible in many areas to severe impacts from proposed alignment, construction and operation of the pipeline.
- may be mitigated to some extent with available construction options.

However, it is clear that even with available mitigative measures, sensitive environmental areas and severe impacts will remain. Below, severe areas are summarized, followed by a general discussion of the advisability of an East Olympic Pipeline Route.

## Severe Areas

The physical characteristics and biological characteristics discussed in previous sections of this report are summarized by the matrix in Table 9.

The most severe area in terms of physical construction problems, coupled with vital resources are:

- The Salmon-Snow Creek system
- The Quilcene system
- The Jackson Creek system
- The Dosewallips system
- The Duckabush system
- Fulton Creek

MacDonald, Turner, Spencer Creeks and the lakes are of lesser importance by comparison only. These systems may still be seriously impacted by poor construction or by operational hazards.

## Advisability of an East Olympic Pipeline Route

From field observations and a compilation of the available literature, it is clear that vital resources will be impacted by a project of this type and magnitude. Northern Tier and BLM have conducted brief analyses of cross-sound routes. No consideration has been made of a route passing west of the Olympics, to Aberdeen, then east to the Olympia area. Certainly such a route, or a cross-sound route, also pose environmental problems. However, the relatively pristine areas and vital resources of Hood Canal make selection of the proposed East Olympic Peninsula Route unadvisable. We recommend that Jefferson County contest this route as being not in the best long-term interests of the county.

CONT

Table 9
STREAM SENSITIVITY MATRIX

| STREAM OR LAKE | SOILS | | | WATER | | FISH | | | SHELLFISH & INVERTEBRATES | | | | WET-LANDS | WATER-FOWL | HARBOR SEAL ANNUAL USAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steep Slopes | Instability or Slippage | Erosion Hazard | Aquifer | Flood Area | Salmon Spawning and Rearing | Trout Spawning and Rearing | Herring & Smelt | Intertidal Clams | Subtidal Clams | Oysters | Crabs & Shrimp | Tidal or other marsh | | |
| Salmon Creek | X | | X | | | X | X | | | | | | | | |
| Snow Creek | | | | X | X | X | X | | | | | | | | |
| Salmon-Snow Estuary | | | X | | | X | X | X | X | X | | | X | X | |
| Crocker Lake | | | X | X | | | X | | | | | | X | X | |
| Peterson Lake | | | X | X | | | | | | | | | | | |
| Tarboo Lake | | | X | | | | X | | | | | | X | | |
| Leland Lake | | | X | X | | | X | | | | | | | | |
| Little Quilcene River | | | | | X | X | X | | | | | | | | |
| Big Quilcene River | | | | X | X | X | X | | | | | | | | |
| Quilcene Estuary | X | X | X | | | X | X | X | X | X | X | X | X | X | X |
| Spencer Creek | X | X | X | | | X | X | | | | | | | | |
| Jackson & Marple Creeks | X | X | X | | | X | X | | | | | | | | |
| Turner Creek | | | X | | | | | | | | | | | | |
| Dosewallips River | X | | X | | | X | X | | | | | | | | |
| Dosewallips Estuary | | | X | | | X | X | | | X | X | | X | X | X |
| Duckabush River | X | | X | | X | X | X | | | | | | | | |
| Duckabush Estuary | | | X | | | X | X | | | X | X | | X | X | X |
| McDonald Creek | | | X | | | X | X | | X | | | | | | |
| Fulton Creek | | | X | X | | X | X | | X | X | X | | X | | |

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L-17

Melville, Montana 59055
April 4, 1979

BLM - Northern Tier Project
Room 3799, Lloyd Building
900 N.E. Multnomah
Portland, Oregon

Dear Sir,

I am writing this letter to express to you personally, my vehement disapproval of the Northern Tier Pipeline Project as a whole, as well as my objection to the proposed Pipeline to Melville area alternate route. My objection is based on a multiplicity of factors which I would like to briefly summarize.

I. Economic - the detremintal economic influences are well documented. We need only to look to the Alaskan Pipeline for undeniable proof. Schools, businesses, utilities, etc. are overwhelmed by a sudden influx of transient labor and are totally unable to meet even fundamental needs for food, power, housing, sewerage, recreation, etc. The fragile economic status of the many small communities (ie Melville) in the path of the proposed pipeline would be shattered. What do we get for our sacrifice? Do we get cheaper oil, gasoline, heating fuels, etc.? People outside those communities reap the long term gains, while we are left with a transient financial gain and long term visual eyesore. Those of us who give up the most get the least! I object strenuously to this kind of logic.

II. Environmental - I personally see no way for this pipeline to be anything but environmentally disastrous. The findings in the Draft Environmental Statement seem to make this an undeniable fact. Unnecessary distrubance of pristine wilderness, wildfowl habitat, wild game ranges and valuable fisheries resources seems to high a price to pay. Our industrial history should provide us with adequate evidence of what can happen when we destroy our rapidly shrinking remote areas in the name of progress!!

III. Sociologic - I believe that this may be the most significant detriment of all. We who live in these areas enjoy a quality of life which is already rare. We enjoy clean air, clean water and clean living. The small community is a place of sharing, personal involvement, people who care about each other and a slow pace of life. Do you dare leave your home and automobile unlocked? The problems associated with this type of development have no place in our rural communities, for the scars may never go away.

These are just a few of the reasons I oppose the Northern Tier Pipeline, and thank you for your time and consideration in this issue.

Sincerely,

Hazel Coughlin

cc: President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee
Dept. of Natural Resources & Conservation
Governor Tom Judge

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L-18

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230
(202) 377-[illegible] 4335

April 3, 1979

Mr. Dick Miller
Department of Interior
18th and E Street, NW
Room 3642
Washington, D.C. 20240

Dear Mr. Miller:

This is in reference to your draft environmental impact statement entitled, "Crude Oil Transportation System Angeles, Washington to Clearbrook, Minnesota." The enclosed comments from the Maritime Administration and the National Oceanic and Atmospheric Administration are for forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving 12 copies of the final statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosures from: Capt. George Steinman
Maritime Administration

Mr. Gordon Lill
National Ocean Survey, NOAA

Mr. Howard Harris
Environmental Research Lab.
NOAA

**A**

MEMORANDUM FOR: Dr. Sidney R. Galler
Deputy Assistant Secretary for Environmental Affairs
Department of Commerce

Subject: Draft Environmental Impact Statement - Crude Oil Transportation System - Port Angeles, Washington to Clearbrook, Minnesota (CN 7901.28)

In accordance with your request of January 26, 1979, the Maritime Administration has reviewed the subject draft environmental impact statement and submits the following comments for consideration.

① 1. Projected Demand and Supply, page 1-4

Discussion:

Table 1.2-3 lists United States crude oil supply by source.

Comment:

It is not clear whether the continental United States domestic source includes Outer Continental Shelf crude oil.

② 2. Interrelationships With Other Projects, Plans, Policies, Private Industry, page 1-61

Discussion:

In the Trans Mountain Pipeline Proposal it is stated that under the Marine Mammals Protection Act of 1972 (16 USC 1380 as amended by P.L. 95-136) voyages of tankers over 125,000 deadweight tons to Cherry Point are prohibited.

Comment:

P.L. 95-136 prohibits the Federal Government from issuing a permit, license or any other authority for constructing, renovating, modifying or altering a terminal, dock or other facility which will affect the navigable waters of Puget Sound, or any other navigable waters east of Port Angeles which would result in any increase in the volume of crude oil capable of being handled at any such facility. This does not prohibit, in any way the use of tankers over 125,000 DWT in voyages to the Cherry Point refinery. The U.S. Coast Guard has, however, had in effect, since March 14, 1978, a ban on the use of tank vessels over 125,000 DWT in Puget Sound. The Coast Guard is attempting to study the entire scope of tank vessel operation in the Puget Sound area in order to arrive at the best solution for protection against environmental harm resulting from vessel or structure damage. The study is scheduled for completion in June 1979 and the ban is in effect until June 30, 1979.

③ 3. Social and Economic Conditions, page 2-46

Discussion:

It is stated that local opposition to the oil port is strong and that expressed concerns include the incompatibility of an oil port with the values and lifestyle of Port Angeles, the possible introduction of oil related industries into the area, damage from oil spill and tanker explosions and degradation of air and water quality.

Comment:

Throughout the draft environmental impact statement the opposition of the Port Angeles population due to the concern about oil spill and tanker explosion damage is noted. Nowhere, however, is there a discussion on the efforts of the United States government to make the marine transportation of oil safer. The U.S. Coast Guard will require existing crude tankers of 20,000 deadweight tons or above, not later than June 1, 1983 to be equipped with an inert gas system. For crude oil tankers of 70,000 deadweight tons or more, the inert gas system requirement will be effective June 1, 1981. The installation of inert gas systems is designed to prevent tanker explosions. The Coast Guard will also require that existing crude oil tankers of 40,000 DWT and above be retrofitted with either segregated ballast or a crude oil washing system. The Coast Guard also has a boarding program to protect against inadequate foreign flag tankers from using U.S. ports.

④ 4. Environmental Impacts of the Proposed Action, Air Quality, page 3-1

Discussion:

This section discusses the impact of tanker stack emissions on the air quality of Port Angeles.

Comment:

A distinction may have to be made concerning the emissions of U.S. flag vessels (which will carry North Slope Crude Oil) and foreign flag vessels which will carry the imported crude oil. The majority of foreign flag vessels use diesel engines as their prime mover and thus emit nitrogen oxide. U.S. flag vessels, which are primarily steam driven, emit sulphur dioxide.

⑤ 5. Environmental Impacts of the Proposed Action, Air Quality, page 3-3

Discussion:

The Northern Tier Pipeline Company has stated that it is proceeding to establish regulations at the Port Angeles unloading facility requiring tankers to use low sulfur (less than 1 percent sulfur) while unloading oil and taking on ballast water.

Comment:

Two types of low sulfur fuels are available. Low sulphur residual fuel (LSFO) is similar to the Bunker "C" fuels commonly used in marine boilers, except that its sulphur content has been reduced. Diesel fuels are also low sulphur but require special care when used in steam boilers, because their higher volatility could result in explosions if they are not properly introduced into a hot boiler.

MarAd also questions the availability of low sulphur fuel on the West Coast. If low sulphur fuel is not available some vessels may obtain diesel fuel in its place to satisfy the low sulphur requirement. While diesel fuel is common and readily available, the fact that it is different in viscosity and volatile content may create an unsafe condition. Fuel heating requirements would change, burner (atomizer) tips may have to be changed, combustion control adjustments would need to be made, etc.

⑥ 6. Environmental Impacts of the Proposed Action, Hydrocarbon Emissions, page 3-9

Discussion:

In the discussion of hydrocarbon emission it is stated that the operation associated with the unloading of crude oil tankers that has the potential of emitting the most significant amounts of hydrocarbons is ballasting. Tankers equipped with segregated ballast would reduce these emissions to zero and that very few (21 percent) of the tankers bringing crude oil to the port would not have segregated ballast.

Comments:

It should be noted that the vast majority of both U.S. and foreign flag vessels do not have segregated ballast tanks. Only some of the more recently constructed vessels are so equipped. It may be difficult to charter such a high percentage of vessels equipped with segregated ballast.

⑦ 7. Social and Economic Conditions, Operation Phase, page 3-51

Discussion:

This section discusses the varying government and industry liability funds.

Comment:

A discussion of Congressional efforts to develop a comprehensive legal regime providing for liability and compensation for damages resulting from oil pollution incidents should be included.

⑧ 8. Summary of Alternatives, page 5-3

Discussion:

The section discusses the Cherry Point alternative and its related oil spill risk.

Comment:

The draft environmental impact statement attributes oil spillage of 1,100 barrels of oil to the Cherry Point alternative. It should be made clear whether the 1,100 barrels of oil spilled is an addition to the oil spilled at Cherry Point because of present operations or whether the 1,100 barrels represents total pollution.

⑨ 9. Transport by Tanker and Mid Continent Pipelines, Shipment Around Cape Horn to the Gulf Coast, page 8-111

Discussion:

This section, in part, discusses LOOP, the deepwater port facility located in the Gulf of Mexico and states that the firms involved in the construction and operation of LOOP have not yet accepted the stipulations by the U.S. Department of Transportation.

Comment:

The companies involved in the construction and operation of LOOP have, in effect, accepted the Department of Transportation's conditions and construction has begun. It is scheduled to become operational in 1981.

Original signed Kenneth N. Forbes

GEORGE C. STEINMAN
Chief, Environmental Activities Group
Office of Shipbuilding Costs

cc: 700, 730, 730.2, 740, 970
DHSeaman/bag 2/13/79

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**B**

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

OA/C52x6:JLR

MAR 1 1979

TO: PP - Richard L. Lehman

FROM: OA/Cx1 - Gordon Lill Gordon Lill

SUBJECT: DEIS #7901.28 - Crude Oil Transportation System: Port Angeles, Washington to Clearbrook, Minnesota

The subject statement has been reviewed within the areas of NOS responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

The following comment is offered for your consideration.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments.

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**C**

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
MESA PUGET SOUND PROJECT
7600 SAND POINT WAY NE
SEATTLE, WASHINGTON 98115

DATE: March 16, 1979

TO: PP/EC Richard L. Lehman

FROM: RFx53 Howard S. Harris

SUBJECT: DEIS #7901.28 - Crude Oil Transportation System: Port Angeles, Washington, to Clearbrook, Minnesota.

The subject DEIS has been reviewed by members of various NOAA labs and offices in the Pacific Northwest, including the MESA Puget Sound Project Office (MP), Pacific Marine Environmental Lab (ERL), Environmental Conservation Division (NMFS-NWAFC), Marine Mammal Division (NMFS-NWAFC), and the Environmental and Technical Services Division (NMFS-Northwest Region). Three discussion meetings took place involving various members of these NOAA components. Written comments were submitted by the participants to the MESA Puget Sound Project Office. Comments from Pacific Marine Environmental Lab and the MESA Puget Sound Project Office accompany this memo. National Marine Fisheries Service comments will be forwarded separately to PP/EC.

This memo serves to consolidate and highlight comments made by the aforementioned groups.

① 1) Figures in the DEIS on pages 3-19 through 3-24, 8-14, 8-15, 8-23 through 8-26, 8-33, 8-34, 8-40, 8-41, 8-52, and 8-53 portray hypothetical impact areas of oil spills based on trajectory simulation results using a net estuarine flow of 0 cm/sec. The text on page 3-16 erroneously states that a flow of 24 cm/sec was used.

The figures shown on the pages listed above may be confusing to some readers who might assume that the blackened areas in those figures represent one continuous, massive oil slick. Further explanation of what the figures portray should be added to the DEIS to clarify this point.

② 2) On page 3-17, the in-transit, at-berth, pipeline, and tank farm oil spill risks are discussed. At-berth spill incidences could be higher if data were used concerning spills of oils other than the crude oil cargo only.

The submarine pipeline spill incidence rate could be an order of magnitude higher than indicated in the DEIS if USGS Gulf of Mexico pipeline spill data were used for the risk assessment.

③ 3) On page 3-14, insufficient information is presented concerning corrosion inhibitors, bactericides, and water temperatures to draw conclusions about impacts of hydrostatic test waste water on the Strait of Juan de Fuca and especially Siebert Creek receiving waters.

Also on page 3-14, insufficient information is presented concerning the water quality of surface water runoff (treated only by separating and filtering) from storage tanks; and conclusions concerning the impact of this wastewater on receiving waters are difficult to make.

④ 4) On pages 3-26 through 3-24, the information concerning impact of oil on marine mammals is understated, incomplete, and in some cases incorrect. Contrary to statements in the DEIS that marine mammals most likely would avoid oil spills (pages 3-32 and 5-6), oil has been shown to be stressful to marine mammals and to cause their death.

The DEIS states on page 3-32 that no impact on rare and endangered species is anticipated; but the Marine Mammal Division concludes that some impact on whales would be expected.

Compare the table on page 2-25 with the figure on page 3-33 of the DEIS. Wherever harbor seals show up in the table, a corresponding impact should be shown in the figure. At present, inconsistencies exist between the table and the figure.

In the figure shown on page 3-33, the impact of oil on sea otters should be shown as severe, rather than moderate, since sea otters likely will die when exposed to oil.

⑤ 5) The figure on page 3-27 and related text on page 3-32 neglect to point out one possible aspect of recovery--namely that the organisms (community structure) taking over a habitat at the end of the recovery period could be different than the original, pre-spill inhabitants.

⑥ 6) On pages 2-79, 3-72, and 3-75 through 3-78, a discussion of freshwater juvenile stages of salmon and trout is lacking. The impact of pipeline construction on stream quality and juvenile fish must be addressed since one potential significant impact is the extermination of an entire year class of a sea run population (e.g. pink salmon).

⑦ 7) On page 3-50 of the DEIS, a statement is made that salmon and other fish would avoid an oil spill. Based on fish mortalities associated with the Amoco Cadiz spill, this statement might be subject to challenge.

⑧ 8) On page 3-79, the DEIS states that during the pipeline construction phase no impact to the marine resources of Hood Canal would be expected. Yet, page 3-113 states that loss of some shellfish habitats could result from sediment or water disturbance. Considering the number of river crossings to be made by the pipeline adjacent to Hood Canal, the possibility exists that some impact from construciton-caused river turbidity on the marine resources of Hood Canal near the river mouths would take place.

⑨ 9) On page 2-161, no mention is made of the fact that Hood Canal often becomes highly stable and stratified during the summer. This physical state makes Hood Canal more vulnerable to pollution than the rest of the region; and implications to oil spill effects are critical and should be addressed in the DEIS.

⑩ 10) Unique and highly important marine mammal, marine bird, intertidal biota, and nearshore fish communities occur in habitats near the Dungeness Spit/Jamestown/Sequim Bay/Protection Island area. The impacts of the operations phase at Ediz Hook

⑩ on the aforementioned biologic communities and their preferred habitats have not been discussed in detail commensurate with the biologic data available and the spill trajectories.

No mechanism exists for the reader to relate the impact data in Tables 3.1.7-5 and 3.1.7-6 to the real environment. Available biologic data should be added to that already contained in the DEIS; and the relationships should be shown between the spill trajectories and the locations of the marine biological resources. Once this connection has been made, conclusions concerning the impact of a spill on the biota will follow.

Enclosed please find the following memos detailing further comments on the Draft Environmental Impact Statement;

February 7, 1979 Review of BLM Environmental Statement by Bob Stewart. (PMEL)

February 14, 1979 PMEL Review of BLM Environmental Impact Statement from Glenn Cannon.

March 01, 1979 MESA Puget Sound Project Office comments on DEIS #7901.28.

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**D**

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
MESA PUGET SOUND PROJECT
7600 SAND POINT WAY NE
SEATTLE, WASHINGTON 98115

DATE: 03/01/79

TO: PP/EC Richard L. Lehman

FROM: RFx53 Howard S. Harris

SUBJECT: MESA Puget Sound Project Office comments on Draft Environmental Impact Statement, DEIS #7901.28 - Crude Oil Transportation System: Port Angeles, Washington, to Clearbrook, Minnesota.

Chapters 2, 3, and 8

① 2.1.1.7

The marine biologic information presented in the DEIS has little relevance to the Port Angeles site-specific problem. The discussion of preferred habitats are not related to the actual situation in the Port Angeles area. That is, where are the critical habitats in the Port Angeles area? Data exist which describe marine mammal, marine bird, intertidal biota, and nearshore fish communities in the Port Angeles region. These data could be used along with the preferred habitat tables (2.1.1.7-6 and 2.1.1.7-7) to form conclusions specific to the area about biologic values.

None of the available hydrocarbon data for the area have been used. These data show that Ediz Hook is already exposed to oil, whereas the Dungeness Spit/Jamestown/Discovery Bay area is not; and the latter support important biologic communities.

On page 2-15, the first sentence in paragraph two implies that surface water in Port Angeles Harbor is transported out to sea, whereas the last sentence of paragraph three indicates an eastward movement along shore toward Dungeness Spit. The eastward drift is in good agreement with Evans-Hamilton, Inc. drifter studies in Port Angeles Harbor.

The second sentence in paragraph two on page 2-15 states that net seaward movement in the vicinity of Port Angeles Harbor is two knots. The use of "vicinity" should be made clear. Transport in the Strait (vicinity) and the Harbor are not the same.

In paragraph four on page 2-15, the statement is made that the time required to flush or replace the water confined by Ediz Hook is long compared to the waters in the Strait. The question of "how long" is important.

On page 2-15, the discussion of Port Angeles Harbor apparently is based entirely on the Federal Water Pollution Control Administration report of 1967. This report presents generalized circulation patterns which are based on limited field observations. Other physical information for the harbor is available in OIW's Oil Spill Risk Analyses for the Federal Northern Tier Pipeline Environmental Statement. The OIW report references studies by Tollefson (IIT Rayonier, Inc.) which would be of use in the discussion of Port Angeles Harbor.

The DEIS does not mention the possible wind effects on the circulation in and around Port Angeles Harbor. Recent studies by PMEL and Evans-Hamilton, Inc. (surface drifters and drift cards) indicate that surface transport is influenced strongly by the wind.

② 2.1.2.7

The fact that Hood Canal becomes highly stable and stratified often during the summer was ignored; and implications of this water column structure to the fate and effects of spilled oil should be addressed.

③ 2.1.2.14

This section does not describe adequately the importance of environmental quality to the recreational value of inland marine waters. All activities listed in the EIS depend upon clean water, aesthetics, unspoiled beaches, and diversity of biota.

④ 3.1.7

MESA studies have shown that degradation and weathering of crude oil is very slow in the Strait of Juan de Fuca, both in the water and intertidal sediments. Without nutrient enrichment (artificial) no detectable loss of oil by degradation takes place in a month's time. Weathering causes a one-third loss of total oil by weight. If the oil enters the sediments, degradation and weathering all but stops. The gravelly/sandy beaches between Morse Creek and Dungeness Spit have little degradation capability, though weathering there would be enhanced by wave action. The Ediz Hook and Dungeness Bay areas have a little better capability to degrade oil, but because of the soft sediments, adsorption of oil by the sediments is rapid and long-lasting. In some previous spills involving environments similar to Dungeness Bay, oil has remained in the subtidal soft sediments for up to ten years.

Possible effects would include mutations, cancer-formations, and other sublethal physiological effects.

A Neah Bay spill in September would effect Tongue Point marine preserve county park.

**L-18 CONT**

④ A Sekin River spill in March would affect Slip Point intertidal tidepools and Tongue Point marine preserve/county park.

A Sekin River spill in September would effect Slip Point tidepools.

A Port Angeles spill in March would affect huge Jamestown tideflats/eelgrass beds/kelp beds system, the National Wildlife Refuge at Dungeness Spit, dense sea bird and harbor seal populations between Port Angeles and Dungeness Spit, important intertidal and nearshore fish communities in Burrows Bay area, and harbor seals at Point Colville (Lopez Island). The impact for a Port Angeles spill in September would be similar, but would include more damage to shoreline birds and harbor seals in the Port Angeles area.

All scenarios would include losses to subtidal invertebrates which are important food for juvenile salmonids.

The purpose, application, and need for figures 3-30 and 3-31 are unclear.

Much of the discussion relates to in-transit spill scenarios and the possible effects thereof; but very little attention is given to the spill trajectory and effects of the operations phase at Ediz Hook. Specifically, no mention is made of the relative biologic value of the nearshore and intertidal habitats in the immediate vicinity of Port Angeles which would be affected by oil spilled or leaked at the terminal during the operations phase.

The possibility and effects of chronic low level oil inputs mostly are ignored. We know that Port Angeles harbor presently is stressed by hydrocarbons, including many of petrogenic origin. The effects of additional inputs could be significant, especially if nearby biologic communities also become stressed. Effects upon fish histology, physiology, and reproduction are possible.

Figure 3.1.7-9 contains impact ratings which are not based upon any data, but, rather, upon subjective opinions. No conclusions are drawn from this figure, nor from Tables 3.1.1.7-7 or 3.1.1.7-8. Figure 3.1.1.7-9 indicates that all biologic groups except shoreline birds, tidepool and nearshore fishes, algae and grasses are vulnerable to severe impacts. All these groups could suffer severe impacts; and all are important to the ecology of nearshore environments. Sea grasses do not occur on rocks. Estuarine shorebirds do not occur in open water. These graphics should be revised and used in drawing conclusions about effects of the pipeline project or totally deleted.

No mechanism exists for the reader to relate the impact of the data in Tables 3.1.7-5 and 3.1.7-6 to the real environment. For example, where do highly vulnerable salt marsh and eelgrass beds occur in the area and where are they relative to the oil spill trajectories? Where are the significantly-impacted subtidal communities and seabirds and where are they relative to the oil spill trajectories? Specifically, the highly productive, large kelp beds and eelgrass beds located at Morse Creek are likely to occur in the spill trajectory paths of most scenarios; and yet these beds are not treated in the tables, figures, and text.

⑤ 8.4.1.1 Cherry Point

The biologically important coasts of islands facing Rosario Strait are not discussed relative to in-transit spills in that area. The entire San Juan/Bellingham Bay/Anacortes area potentially would be affected by spills in the Rosario area.

⑥ 8.4.1.2 Burrows Bay

Burrows Bay has an exceptionally dense run of juvenile salmon, which actively feed upon epibenthic invertebrates. Both resources would be vulnerable to the effects of oil. Seals on Colville Point and Decatur Island would be affected by spill trajectories, as would seals inside Deception Pass. The marine research lab at Rosario Beach would be affected. Considerable sport scuba diving activity occurs in Burrows Bay along with fishing.

⑦ 8.4.1.4 Freshwater Bay

Major spill impacts would include damage to the State marine preserve at Tongue Point, an area with extremely productive intertidal communities; damage to bird populations in the Crescent Bay/Agate Beach area; and damage to the Crescent Bay resort/marina business. A major sports salmon fishery occurs at Crescent Bay.

⑧ 8.4.1.5 Low Point

Oil spills would affect the State marine preserve at Tongue Point, an area with extremely productive intertidal communities; the resort/marina businesses at Crescent Bay; the marine bird/mammal species in the Observatory Point/Freshwater Bay/Crescent Bay area; and possibly the salmon fishery off Deep Creek.

Figure 8.4.1.7-1 (shown on page 8-46) does not show alternate sites 1 - 4.

⑨ Map Addendum to the DEIS

For Map 28, add extensive eelgrass beds at Morse Creek west of Green Point; extensive eelgrass beds between Dungeness and Gibson Spit; one of the state's largest kelp beds off Jamestown; kelp beds between Observatory Point and Tongue Point; and eelgrass beds at Beckett Point.

For Map 32, add Pacific oyster culture in Sequim Bay.

For Map 35, add intertidal and subtidal clams in mid-Sequim Bay.

For Map 42, add waterfowl in the Green Point/Port Angeles/Dungeness Spit area.

For Map 44, add harbor seals in the Port Angeles/Green Point/Jamestown/Protection Island area; sea lions in Race Rocks, San Juan Island, and Sucia/Matia/Patos Islands; harbor seals in Padilla Bay, Samish Bay, Lummi Island, Speiden Island, Waldron Island, Pillar Point, Sucia/Matia/Patos Islands, and Lopez Island; killer whales in the Eastern Strait of Juan de Fuca, Rosario Strait, Admiralty Inlet, and San Juan channel; and the occasional occurrence of killer whales in Sequim Bay.

Alignment Sheet 1 does not stress the highly important and critical value of Dungeness Spit as a National Wildlife Refuge, bird/mammal area, oyster culture, fishing, eelgrass beds, kelp beds, and aesthetic/recreational area. The alignment sheet does not emphasize the potential eastward oil spill trajectories from Port Angeles. The alignment sheet does not include potential damage to Jamestown/Sequim Bay/Protection Island area. The alignment sheet does not include potential damage to out-migrating juvenile salmon which follow the shoreline very closely and feed upon epibenthic invertebrates.

Alignment Sheet 2 does not include the loss of habitat for seal haul out on McNeil Island; loss of food items for salmon fry in the Nisqually River, damage to the wildlife refuge in the area, and avoidance of the river by adult salmon.

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**CONT.**

**E**

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
Pacific Marine Environmental Laboratory
NOAA Building Number 264
7600 Sand Point Way NE
Seattle, WA 98115

DATE: February 14, 1979

TO: Howard S. Harris

FROM: Glenn A. Cannon Glenn A. Cannon

SUBJECT: PMEL Review of BLM Environmental Statement

Most of the Oceanography in the Draft Statement concerns modeling, and the attached detailed review by Bob Stewart adequately covers that material.

① In addition, there is no reference to the recent oceanographic studies summarized in NOAA Technical Report ERL 399 - PMEL 29. I understand preliminary copies were sent to them in late spring/early summer 1978. That report described other data which indicated the probability of spilled oil reaching beaches throughout the Strait. Those data were from drift-card studies and moored current meter arrays. There data also indicated a high incidence of surface flow reversal (into the estuary) during fall/winter/spring coastal storms. However, even though they have not used those results, they still point out the high possibility of spilled oil reaching the beaches, and the modeling work done for them by PMEL is more recent than in the technical report. They also indicate the possibility of spilled oil in the Port Angeles area reaching Dungeness or even Whidbey Island. This also is indicated in our studies, but they are not referenced.

② There is no discussion of the Port Angeles surface drifter studies carried out by your office, but I am not sufficiently familiar with those results to summarize them or to know their significance to this Environmental Statement.

Finally, we do not have detailed knowledge of flow very near shore (inner mile or so) or at the mouths of the various streams. However, if spilled oil got into southern Hood Canal, I expect it would take considerable time to flush out. Also, we have not finished our study in the eastern Strait, thus cannot predict flow patterns beyond what has been done with the models.

FEB 1979 RECEIVED

In conclusion, I feel they have shown various possibilities of spilled oil reaching the beaches, thus there probably are other possibilities. In this respect, I feel they have been fair, even if not all the data and studies were referenced.

After you review the comments from the other reviews, I would be happy to attend another meeting if it is needed. However, my feeling is that another meeting probably is unnecessary. Also, I will be happy to check drafts of the overall review which your office puts together.

cc: M. Glendening
R. Stewart

GC:dw

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
Pacific Marine Environmental Laboratory

February 7, 1979

To: Glenn Cannon

From: Bob Stewart

Subject: Review of BLM Environmental Statement

Attachment 1 to this memo is a detailed listing of my comments on the subject environmental statement. The main points are:

(1) The trajectory results are not the most recent. The BLM is aware of this, and they are changing them in the final version.

(2) The blackening of the trajectory region is visually deceptive and should be changed. I talked to BLM and they are modifying the graphics.

(3) The size variation of the potential oil spills is not explicitly discussed and yet this is a major feature of the problem. OIW's spill incidence figures are for rather small (2.4 bbl) spills, and to imply that every such spill is important is misleading.

(4) The written descriptions of oil spill impacts are generally very good. However, these thoughts are scattered throughout the text, and they do not seem to be drawn together for use in the summaries.

(5) My own analysis of the spill incidence values suggests that the at-berth and at-anchor spill rates are reasonable but the submarine pipeline rates are on order of magnitude too low. I also question the validity of OIW's confidence limits.

cc: Marcia Glendening

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**CONT.**

COMMENTS ON THE (DRAFT) ENVIRONMENTAL STATEMENT

CRUDE OIL TRANSPORTATION SYSTEM

by

Robert J. Stewart

③ Page 3-15 The potential spill impact sites mentioned in the summary section should be changed to reflect the results of the final version of my report on the trajectory simulations. The results quoted were taken from an early draft of my report and they do not include the simulated estuarine flow. The lower plates of Figures 6a, b, and 7a, b, and the summary figure, Figure 14, of my final report should be utilized for the in-transit trajectory analysis.

④ The summary's use of the words "oil spill" to connote all possible spill events is misleading. The OIW spill frequencies are simply for spills in excess of 2.4 barrels (100 gallons), and a distinction should be drawn between the impacts of a small spill in the 100 gallon range and a 10,000,000 gallon spill. The summary's comments are best taken to apply only to very large spills, which are very much less frequent than the 100 gallon spill.

⑤ 3-16 The description of PMEL's oil spill model erroneously states that the model includes a "net estuarine flow of about 24 cm/sec." The results used in the Environmental Statement in Figures 3.1.7-1, 2, 3, 4, 5, and 6 (and later in Figures 8.4.1.1-2, 3, and 8.4.1.2-2, 3, 4, 5, and 8.4.1.4-2, 3 and 8.4.1.5-1, 2, and 8.4.2.1-1, 2) are all based on trajectory simulations in which the estuarine component was set at 0 cm/sec. For the spill sites in the Straits I recommend that the trajectory predictions be changed to reflect the results we obtained using an estuarine component of 10 cm/sec (March) and 30 cm/sec (September). This should be discussed in text on page 3-16.

⑥ 3-17 It is highly debatable that volume throughput is a reasonable choice of exposure variable for spill incidence for submarine pipelines. Most submarine pipeline spills are due to events that are in no way related to pipeline throughput. Examples of common pipeline spill causes are fouling by ship's anchors, breakage by wave induced sediment motions, and rupture by a ship grounding on exposed portions of the pipeline. These considerations make it highly questionable that "volume throughput as an exposure variable would have been preferable." Since this thought is also extraneous to the arguments of this paragraph, I recommend the sentence be dropped.

⑦ 3- The spill frequency estimates for the submarine pipeline seem to be much too low. Based on an analysis I did of USGS pipeline spill data in the Gulf of Mexico for the years 1973-1975, a typical spill incidence value is .01 spills (over 2.4 barrles) per pipeline-mile-year versus the Environmental Statement's value of .0008 (± .0006) spills per pipeline-mile-year. My data included 76 spill incidents and 3,700 pipeline-mile-years. About half the spills were less than 2.4 barrels. If the 95% confidence interval quoted in the statement is to be believed, then the Gulf of Mexico's offshore development had a truly remarkable run of bad luck in 1973 to 1975. (Reference—"An Analysis of U.S. Tanker and Offshore Petroleum Production Oil Spillage through 1975," R. J. Stewart and M.B. Kennedy, Martingale Report to the U.S. Department of the Interior, May 1978, Contract 14-01-0001-2193, pp 92-96.)

3-17 The spill frequency calculated for the tanker berth operation is based on a port call methodology that is somewhat controversial. Another way of examing these spill frequencies is by comparison with the pipeline operation in Portland, Maine. The Portland pipeline receives foreign tankers at a rate of about one tanker per day (460 tankers in 1973, 449 in 1974, and 389 in 1975), and it tranships about 165 x $10^6$ barrels of crude oil per year to Canada (450,000 barrels per day). It is thus very similar to the proposed terminal, although its volume throughput is lower by about a factor of three halves and it does not use submarine pipelines in any part of its operations.

In the period 1973 to 1975 Coast Guard data shows that this terminal had eight spills of crude oil that were larger than 2.4 barrels (the largest spill was 82.5 barrels). There were in addition, an undetermined number of spills of fuel oil and lubricating oil. In 1975, spill records from the Maine Department of Environmental Protection indicate that there were two spills of Bunker C over 2.4 barrels, as well as one spill of crude oil from tankers calling at the Portland terminal. There were, in addition, sixteen spills of crude oil and fifteen spills of fuel, lubricating, or waste oils that were less than 2.4 barrels. Thus, the number of spills of crude oil and the number of spills of other oils were in about equal proportion, and I estimate that there were about sixteen spills over 2.4 barrels associated with the Portland facility in the period 1973-1975 (there were certainly ten spills over 2.4 barrels including the eight crude spills and the 2 Bunker C spills of 1975).

The expected number of tanker spills for the proposed facility based on the numbers in Table 3.1.7-2 of the Environmental Statement vary between 1 1/2 to 2 spills per year depending on the volume handled (709,000 and 933,000 barrels per day respectively). If we take into account their "95% confidence limits" we find a range of one to three spills per year. This is in rough agreement with Portland's 1975 record, although it is not in agreement with the 1973 and 1974 records. I therefore concur with the order of magnitude of the spill frequency predictions, but I believe the problem is more complicated and less well resolved than the table and its 95% confidence intervals would lead one to believe.

⑧ 3-19 through 3-24 and 8-14 8-15 8-23 8-24 8-33 8-34 8-40 8-41 8-52 8-53 Figures 3.1.7-1 and all the other figures indicating oil spill impact regions for Strait of Juan de Fuca spill sites should be redrawn using trajectories calculated with the estuarine current assumption. Further, all trajectory figures should be revised to show the region of impact using cross hatching or some other visually neutral method. The technique of blackening the region that is used in the Draft Environmental Statement suggests an oil spill outline. Such an interpretation of the trajectories contained in my report is incorrect and misleading.

An oil spill of the size suggested in Figure 3.1.7-1 is both very unlikely and it will not assume the shape shown. It should be remembered that the spill frequency predictions were for all spills over 2.4 barrels. Most of these spills will fall in the smaller size range. Also the various trajectories used by the BLM artist to outline this region occurred days and weeks apart and do not constitute a simultaneous outline. Over such long periods of times, oil will be relaunched from its initial beaching spot and transported up or down the Strait. Thus a correct graphical presentation of a very long-lasting oil spill such as that suggested by the figure would consist of tendrils of oil emanating from the spill site with oil pools trapped against lee shores and transported along the lee shore away from the initial beaching spot. Our model does not consider these possibilities and so its results should not be interpreted in this light.

⑨ 3-25 The statement that oil is less toxic and the resulting impact reduced as a result of weathering is somewhat controversial.

⑩ 3-47 The statement in the summary that an oil spill would only affect tourism for a "short time" is not consistent with the possible very long term affects of a spill like the AMOCO CADIZ. Further, highly seasonal, tourist-related industries could be wiped out with an ill-timed large spill even if the oil was cleaned up quickly. See also paragraphs 7.3.2 (page 7-2) of the Draft Environmental Statement.

8-51 My earlier remarks on the variance between my submarine pipeline spill incidence rates and the .0008 rate used in the report also

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**F**

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Environmental & Technical Services Division
P. O. Box 4332, Portland, Oregon 97208

March 27, 1979 FNS5:CES

TO : EC - Richard Lehman

MAR 2 3 1979

THRU : F7 - Kenneth Roberts

FROM : FNWS - Dale R. Evans Dale R. Evans

SUBJECT: Comments on Draft Environmental Impact Statement (DEIS) -- Crude Oil Transportation System: Port Angeles, Washington to Clearbrook, Minnesota, USDI, BLM - DEIS #7901.28

The subject DEIS that accompanied your memorandum of January 31, 1979, has been received by the National Marine Fisheries Service for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

General Comments

① The DEIS lacks sufficient detailed information upon which to base an accurate evaluation of the potential impact of the proposed action on the marine, estuarine or anadromous fish resources, or on the commercial or marine sport harvest of those resources. We suggest that the Final Environmental Impact Statement (FEIS) provide a risk analysis for potential spills and volumes for:

1. Terminals that involve the shortest travel distance for tankers entering the Strait of Juan de Fuca. Possibly risks of major spills could be minimized by getting the oil into pipelines as soon as possible.

2. Terminal safety features related to sheltered locations that reduce risk for spills.

3. Buried pipelines and exposed pipelines, both in upland and marine routes.

② The Trans-Alaska Pipeline (TAP) from Prudhoe Bay to Valdez was constructed over environmentally sensitive areas. State and Federal fish and wildlife teams assisted the developers in planning and designing the project as called for in an "Agreement and Grant of Rights-of-Way." The FEIS should address whether a similar agreement will be achieved to assure that fishery resources are adequately safeguarded. It should also address whether or not the intent is to use the experience from the TAP to design, construct, and operate an even safer pipeline.

Specific Comments

I Description of the Proposed Action
1.4 Proposed Action
Tanker Unloading Facilities

③ Page 1-11, column 2, paragraph 2, last sentence. "Preliminary studies by NTPC indicate that leaks as small as 50 to 100 barrels or 0.07 to 0.14 percent respectively, of the contents of one line could be detected." This statement leads us to believe that leaks less than 50 to 100 barrels would not be detected and would escape into the waters of Port Angeles Bay and Puget Sound. James R. Beasley, "Preliminary Design of Proposed Northern Tier Pipeline Complete," November 20, 1978 edition Oil & Gas Journal, stated that each submarine pipeline "...will be designed for a maximum flow rate of 100,000 bbl/hr through each line." Chronic leaks less than 0.07 to 0.14 percent could adversely affect aquatic resources of Port Angeles Bay.

④ Page 1-14, column 2, paragraph 4. This paragraph states "Oil-water separators...would process the surface water runoff from within the diked tank farm...as well as drainage from tank roof and bottom drains. The effluent would be discharged into Siebert Creek and the Strait of Juan de Fuca...." There is no mention of how water-soluble fractions would be removed from the water before discharge. This should be explained.

Pipeline System
Pipeline Route

⑤ Page 1-22, column 2, TABLE 1.4-8, MINOR STREAM CROSSINGS. This table omits under the heading State of Washington, Clallam, Jefferson, Mason, Thurston, and Pierce Counties, the numbers of minor streams that support anadromous fish populations and would be crossed by the pipeline. We suggest that these be added to the table.

Pump Stations

⑥ Page 1-28, column 1, paragraph 2. This paragraph lists major equipment and support facilities at each pump station. There is no indication that leak sensors will be part of the equipment. We suggest the lack of the sensors be explained in this portion of the DEIS.

Project Construction, Operation, and Abandonment
Pipeline Construction

⑦ Page 1-47, column 1, paragraph 2. "The hydrostatic test would involve filling the line with a suitable liquid test medium, usually freshwater...." and paragraph 4. "Water for testing would be obtained from local streams or rivers if available." About 2,000 acre-feet of water will be required for the hydrostatic test. NTPC must recognize that this amount of water taken from streams must be screened under respective state's criteria to prevent fish from entering the pipeline.

⑧ 1.5 Interrelationships With Other Projects, Plans, and Policies
Federal Government
Department of Commerce (DOC)
National Oceanic and Atmospheric Administration (NOAA)

L-18 CONT

8 Page 1-59, last paragraph. The following statement should be added to this paragraph: "National Marine Fisheries Service (NMFS) as an agency of NOAA provides recommendations concerning marine, estuarine, anadromous and inland commercial fisheries resources for Corps of Engineers permits for work in navigable waters of the United States and release of dredged or fill material into waters of the United States."

9 State and Local Governments

Page 1-61, TABLE 1.5-1, STATUS OF LOCAL PLANNING AND ZONING WITHIN PROPOSED PIPELINE CORRIDOR. Under the column State and County subheading, Washington, add Clallam as a county and complete the table for that heading.

2 Description of the Environment
2.1 Existing Environment
2.1.1 PORT AND ONSHORE STORAGE FACILITIES
2.1.1.14 RECREATION RESOURCES
Pacific Coastal Zone (Cape Flattery to Grays Harbor)

10 Page 2-37, column 1, paragraph 5. "Offshore shell fishing is possible along most of the shoreline from Cape Flattery to Grays Harbor; however, public access is limited." North of Grays Harbor, for a distance of over 20 miles an intensive sport harvest of razor clams occurs annually, and people drive their cars on that section of the beach. It is only in the northern portions of the beach in the area of the Indian reservations and Olympic National Park that public access by automobile is limited.

11 North Puget Sound

Page 2-37, column 2, paragraph 2. This paragraph discusses recreational sport fishing use of North Puget Sound waters. Emphasis is placed on sport salmon fishing. However, the sport fisheries for other important marine species have not been included. The fisheries for demersal and benthic species, as well as herring and surf smelt should be included in the paragraph.

12 Port Angeles

Page 2-37, column 2, paragraph 5. "Approximately 400 recreational fishing boats are moored in Port Angeles." The number of boats is limited by the number of moorage slips in Port Angeles marina and no figure is given for the number of boats that are on trailers in dryland storage and are launched on a daily basis. There is a substantial demand for additional moorage and launching facilities in the Port Angeles area and as more marinas are constructed sport and commercial fishing and recreational boating in Port Angeles Harbor will increase.

2.1.1.15 SOCIAL AND ECONOMIC CONDITIONS

13 Page 2-41, column 2, TABLE 2.1.1.15-7, NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT, Clallam County, 1975. Information on the employment by fishing and tourism industries are not included in the table. We suggest that these are important and should be included.

2.1.2 Pipeline System
2.1.2.6 AQUATIC RESOURCES

14 Page 2-78, column 2. "Biological Components" As only animals are discussed under this heading, we suggest that it be changed to "Zoological Components." Spawning habits and requirements of the major cold water species (salmon and trout) are discussed under this heading. We suggest that rearing requirements for the freshwater stage of trout and some of the juvenile stages of salmon should be discussed here also.

15 Page 2-79, column 1, paragraph 1, sentence 2. "A recent court case...(the Boldt decision) resulted in allocation of the major portion...fisheries." We suggest it be stated "resulted in allocation of an equal portion... fisheries."

Last sentence "Some western Washington streams...." We suggest this be changed to "Most western Washington streams...."

16 Page 2-82, TABLE 2.1.2.6-19, AVERAGE ANNUAL RUN1/ SIZE FOR SALMON IN SELECTED WESTERN WASHINGTON RIVERS2/. Columbia River and the appropriate data is not included in this table. We believe it should be. Footnote 4/ of that table states "The Cedar River also has an average annual run of 150,000 sockeye. This is the largest run of sockeye in Washington." Over a period of six years, 1972-1977, an average annual run of 219,600 spawning sockeye salmon entered the Cedar River (National Marine Fisheries Service May 9, 1978, letter report to the District Engineer, Seattle District Corps of Engineers). The present sockeye salmon escapement management goal of the Washington Department of Fisheries for the Cedar River is 350,000 spawners. This goal was achieved in 1967 and 1977. We suggest that this table be modified to reflect this information.

17 Pages 2-83 through 2-87, Figure 2.1.2.6-2, FRESH WATER LIFE HISTORY PHASES. There are no charts in this series reflecting salmon and searun trout in the Yakima or Columbia River systems. We suggest that they be included.

2.2 Future Environment
2.2.1 FUTURE ENVIRONMENT--PORT AND ONSHORE STORAGE FACILITIES
2.2.1.15 SOCIAL AND ECONOMIC CONDITIONS

18 Page 2-157, TABLE 2.2.1.15-1, POTENTIAL FISHERY PRODUCTION, SELECTED INLAND WATERS OF WASHINGTON. The Columbia River has again been excluded as one of the inland waters of Washington. We suggest that this be added. In addition to other fish species that have been listed, we suggest that Columbia River white sturgeon be listed in this table.

19 2.2.2 FUTURE ENVIRONMENT--PIPELINE SYSTEM
2.2.2.7 MARINE
Biological Components

Page 2-161, paragraph 3, sentence 4. "Raft culture of mussels, Pacific and Olympia oysters, and seaweed and pen rearing of shrimp would increase production." Discussion of suspended net enclosure rearing of salmon in marine environments, developed by the National Marine Fisheries Service, should be included at this point. Several companies are currently engaged in this type of aquaculture.

3 Environmental Impacts of the Proposed Action
3.1 Port and Onshore Storage Facilities
3.1.2 AIR QUALITY
Operation Phase

20 Page 3-3, column 2, paragraph 1. This paragraph discusses the operation of ship's engines while in port. "The engines would also be used to drive the pumps...to load water into the ballast tanks. Such pumping operations usually employ the engines at full load...for about 3 to 5 hours for ballasting." Juvenile salmon on their seaward migrations tend to congregate in schools in embayments such as Port Angeles. Ballasting operations taking on water would also pick up these juvenile fish which would be killed in the tanks that are used for hauling oil. We suggest that screens be required on intakes so that juvenile salmonids will not be pumped aboard or that empty tankers be assisted by tug to mid-channel in the strait before they take on ballast water.

3.1.6 AQUATIC RESOURCES
Physical Components
Construction Phase

21 Page 3-14, column 1, paragraph 6. "Hydrostatic test water for the onshore storage facility site and submarine pipelines would be withdrawn from the Dungeness River (NTPC 1978). Approximately 150,000 barrels of water would be required for the submarine pipelines, piping, and relief tank at the tanker unloading facilities. An additional 1,180,000 barrels of water would be needed for testing the storage tanks (NTPC 6/1978).

CONT

21 Preliminary hydrostatic test plans assume a river withdrawal rate of 6 cubic feet per second (cfs). At this rate, filling operations would require approximately 2 weeks of constant pumping." The National Marine Fisheries Service recommends that the intake end of the pumping system be screened according to Washington Department of Fisheries (WDF) criteria with material having openings no larger than 0.125 inches and that the approach velocity to the screen be no greater than 0.25 feet per second so that downstream migrating salmonid fry and fingerling would not enter the pump or be impinged on the surface of the screen.

Column 2, paragraph 1. "The preliminary hydrostatic test plan states that on completion of testing, the water would remain in the submarine lines to provide stability until displaced by crude oil. To control pipe corrosion, an inhibitor and bacteriacide would be added to the test water as it was pumped into the pipeline." A National Pollutant Discharge Elimination System permit may be necessary to discharge these polluted waters into the Strait of Juan de Fuca. This permit would be issued by the Washington State Department of Ecology upon review by various Federal and State environmental agencies, including the National Marine Fisheries Service.

3.1.7 MARINE RESOURCES
Summary

22 Page 3-15, column 2, paragraph 4, sentence 1. "At-berth oil spills in Port Angeles Harbor would be expected to be small but frequent. Such spills could taint edible marine resources within the harbor and could degrade the water quality." We suggest that the degraded water quality could have a negative impact on many indigenous aquatic organisms including juvenile salmonids on their seaward migrations and their food supply organisms.

23 Page 3-29, column 2, TABLE 3.1.7-6, EFFECTS OF OIL ON MARINE COMMUNITIES BENTHIC COMMUNITIES
Sandy or Muddy Intertidal Communities

The "Expected degree of initial impact" has been rated as "moderate" for these communities. We suggest that this could be "significant" to the oysters in Hood Canal and to the intertidal clam populations of all of Puget Sound and the Strait of Juan de Fuca.

24 3.1.14 RECREATION RESOURCES
Pacific Coastal Zone (Cape Flattery to Grays Harbor), U.S.
Operation Phase

Page 3-49, column 1, paragraph 7, sentence 2. "Important sport salmon fishing areas off Cape Flattery and some minor bottom fishing would be impacted...." Bottom fishing for species other than salmon is becoming extremely important and would not necessarily be considered minor in this instance. We suggest that these resources be discussed in all areas of the Environmental Impact Statement.

Industry and Employment
Operation Phase

25 Page 3-50, column 2, paragraph 4, sentence 2. "Some cleanup costs would probably be incurred by boat owners, nevertheless, salmon and other fish would avoid this spill area, and the loss would be mainly in fishing time." Commercial fishing for salmon occurs only during the short period of the salmon spawning migration runs. A short delay of even two weeks could cause fishermen to miss an entire year's fishing effort, and would be a major loss to the industry. This should be considered a major economic loss and a severe impact to affected communities. Compensation for this loss should be discussed within this portion of the Environmental Impact Statement.

3.2 Pipeline System
3.2.6 AQUATIC RESOURCES
Biological Components
Summary

26 Page 3-72, column 2, paragraph 2, sentence 2. "Reductions to cold water, searun fish populations would probably not be noticed in the ocean commercial, sport, or Indian fisheries, but might be noticed in the river sport and Indian fisheries, particularly if a large number of one year-class were eliminated." We believe that any reduction to marine fishing would be noticed, particularly when the anticipated runs of salmon do not arrive at the accustomed marine locations for harvest. The Washington Department of Fisheries furnished values of local fishery resources in a letter to Mr. Allen Zinc, SRI International, on April 4, 1978, with a copy to Bureau of Land Management. We suggest that these values support our belief.

Construction Phase

27 Page 3-78, column 1, paragraph 1. "Since some searun fish return to spawn every year and others every 2, 3, or 4 years, up to 20 years may be required for some populations to fully recover." We suggest that a run of fish that is killed off may never recover. We particularly point to pink salmon that have a two-year life cycle. If a spawning run is destroyed, that run of fish may become extinct.

Operation Phase

28 Page 3-79, column 1, paragraph 1, sentence 1. "Some crossings could continue to be problem areas throughout the project life as streambed scouring exposed the pipe." In instances where this may be a problem, we recommend a discussion of steps necessary to develop construction stipulations that would ensure burial of the line sufficiently below maximum scour depth to preclude exposure of the line. Another alternative could be to bridge or suspend the pipeline over the stream to avoid the scour problem.

29 Page 3-79, column 1, paragraph 1. "A river crossing pipeline rupture in the Quilcene, Dosewallips, Duckabush, Hamma Hamma or Skokomish Rivers would degrade the water quality in Hood Canal for several months. Particularly severe would be the impact on the Pacific oyster culture." It is important to point out that these streams flow into Hood Canal in the vicinity of Dabob Bay, an area where annual spawning and setting of oysters is fairly assured. Oyster growers in this area supply practically all the domestic commercial seed for stocking oysters in the State of Washington.

30 Further on in that same paragraph, it states that "Marine resources affected would be Pacific oyster culture, subtidal and intertidal hardshell clams, crab fisheries, sports salmon fisheries, and sport and commercial bottom fisheries." We suggest that the sentence be modified to read "Marine resources affected would be Pacific oyster culture, subtidal and intertidal hardshell clams, crab fisheries, sport, commercial, and Indian salmon fisheries, and sport and commercial bottom fisheries."

3.2.14 RECREATION RESOURCES

31 Green Point to Olympia, Washington (Pipeline Mile 0 to 105)
Operation Phase

Page 3-113, column 1, paragraph 6. "An oil pipeline leak or spill at sea or on land would have major impacts...Recreation related to casual day uses, boating, fishing, and shellfish collecting in Hood Canal would be lost for the short term. A pipeline rupture at major river crossings could affect fishing in the Dosewallips, Duckabush, Hamma Hamma, Dungeness, and Skokomish Rivers." In our opinion, this is an understatement. Losses in Hood Canal could extend into a long-term situation. A pipeline rupture at major river crossings on the subject streams could affect sport, commercial, or Indian fisheries on the streams and/or in Hood Canal.

32 4 Mitigating Measures Not Included in the Proposed Action
4.7 Marine Resources
Physical and Biological Components

Page 4-3, column 2, paragraph 2. "3. The applicant would provide a floating "miniskimmer" at each tanker berth and at the fuel barge berth for recovery of small spills within the boom containment area."

Effectiveness:, paragraph 4, last sentence. "However booming and skimming does not contain nor remove sea water soluble fractions in crude oil and would not prevent sublethal biological effects and tainting of fishes and shellfishes." We suggest the inclusion of a discussion of how NTPC would mitigate this problem.

4.13 Transportation and Utility Networks
Committed Mitigating Measures

Page 4-7, column 1, paragraph 3. "2. The U.S. Coast Guard through its permitting process for operation of marine facilities would require: a. That pleasure and fishing craft would not be allowed within a predetermined distance of tankers discharging crude oil." That distance should be stated in the EIS and the reduction of fishing and navigation area should be evaluated in the EIS.

33 5. Any Adverse Impacts That Cannot Be Avoided Should the Proposal Be Implemented
5.1 Port and Onshore Storage Facilities
5.1.7 MARINE RESOURCES
Biological Components
Operation Phase

Page 5-6, column 2, paragraph 2, sentence 2. "Seals and sea lions have been sighted near oil spills, but they do not become contaminated." and Paragraph 4, last sentence. "Seals...would probably avoid the contaminated areas." These two statements appear to be debatable. Oil pollution has caused direct mortality of hair seals in Canada. The following two references support this statement: Warner, R.E., "Environmental Effects of Oil Pollution in Canada," page 10. Memorial University of Newfoundland, 1960; and Fisheries Research Board of Canada, Annual Report, 1966, page 7, Queens Printer and Controller of Stationery, Ottawa, Canada, 1967.

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L-20

CLALLAM COUNTY GOVERNMENTAL CONFERENCE
P.O. BOX 430
PORT ANGELES, WASH. 98362
457 - 5244

clallam county, clallam county public utility district # 1, clallam-jefferson community action council, forks, port angeles, port of port angeles, sequim

March 16, 1979

Manager, Bureau of Land Management
Oregon State Office
729 N.E. Oregon Street
Portland, Oregon 97208

Dear Sir,

This letter is the official response by the Clallam County Governmental Conference to the Draft Environmental Impact Statement evaluating the N.T.P.C Crude Oil Transport System. The comments below address the impacts of the proposed facility on the plans of local governments in Clallam County. The comments are as follows:

1) At the time of the original application by Northern Tier to EFSEC, their proposal was not in conflict with the Port Angeles Comprehensive Plan or its zoning ordinance, being Ordinances No. 1885 and No. 1709 respectively. Since the original submittal date of the Northern Tier application, they have changed their project substantially.

   The City of Port Angeles has also changed its Comprehensive Plan and zoning ordinances. Ordinance No. 1893 amended the Comprehensive Plan, banning oil port projects. The specific language is:

   > Establishment of an oil port in the City of Port Angeles is hazardous to the community and detrimental to the environment and general ecology of the area and accordingly should be prohibited. An oil port is defined as facilities which will result in the receipt of more than an average of 50,000 barrels per day of crude or refined petroleum which has been or will be transferred over marine waters.

   The zoning ordinance was amended by Ordinance No. 1894, which contained essentially the same ban on an oil port.

   Therefore, it is our position that the application of Northern Tier Pipeline Company is no longer in conformance with the land use plans and regulations of the City of Port Angeles.

2) The Northern Tier Pipeline Company project is not specifically addressed in the Clallam County Overall Economic Development Plan (OEDP). The major proposed projects in the OEDP are oriented towards tourism, the wood products industry and redevelopment of commercial areas. A proposed nuclear power plant at

CONT

Blyn was listed as a potential long-range project; however, subsequent studies by the State have resulted in that project being dropped.

   It would appear that the Northern Tier Pipeline Company project is not consonant with the general thrust of the OEDP: however, this is not explicit in the report.

3) There exists two significant issues relating to the adverse impacts the facility will have on electrical and water customers:

   a) The electrical energy issue deals with the availability of power to existing industrial, commercial, and residential customers if, during a power shortage, Northern Tier's facilities are exempt from curtailment proceedings.

      The District's concern is that the pipeline system, with it's large statewide energy requirements, would accelerate the rate at which the curtailment plan is implemented. Its energy requirements, when added to the rising regional load and burdened by slippage of forecasted operational dates of the WPPSS nuclear power projects, may tend to raise the probability of curtailment procedures during "critical" water years. Added to this is the current BPA allocation formula which after July 1, 1983, will limit this District's firm power allocation to 103 percent of an estimated load for that year as it was forecasted in 1973. Since Northern Tier's proposal did not exist in 1973, neither did its expected large energy requirements. Therefore, this District's estimated loads during the pipeline's operational years will probably fall short of the actual loads by large quantities.

      As a result, District customers who do not share the exempt status with a crude oil pipeline system may have to curtail their usage to a greater degree than, other factors remaining the same, they would if the pipeline system was not built.

   b) The second issue concerns the Clallam County P.U.D. owned water system and Northern Tier's proposed activity at Green Point. Their present plan calls for a deep trench to be dug there to allow the two submarine lines to gradually ascent the steep bluff. If this were allowed, the trench would cut into the aquifer that supplies the existing Bluff's Well and Pumping Station which serves approximately sixty residential customers. This, in turn, would very possibly lower the Well's static water level and bring about salt water intrusion, normal operational wastes such as oil sludge, or oil from an oil spill will infiltrate our well since, when pumping, seventy-five percent of the water comes from the strait side and twenty-five percent comes from the mountain side. If Northern Tier plans to pump from wells at the Green Point site, they must prove by testing that they will not affect the capability of the Bluff's Well. Any further drawdown of the aquifer than what is being experienced now will have drastic impacts on the existing well. Clallam County P.U.D. needs to be assured that the proposed Northern Tier Pipeline System will neither jeopardize the availability of energy to our electrical customers nor adversely impact the water quality or its availability to our Bluff's Well customers.

4) The Oilport terminal facility is inconsistent with County Land Use Plans as follows:

   a) The County Comprehensive Plan recommends that the tank farm site and vicinity be developed to residential or agriculture uses. The tank farm is an industrial use and therefore incompatible with the planned uses. Page 17 of the Plan requires industrial land uses to be developed in areas reserved for industry.

   b) The County Interim Zoning Ordinance adopted in 1971, zoned the tank farm site and vicinity as residential. The tank farm is an idustrial use and therefore, incompatible with the zoned uses.

   c) The County Shorelines Master Program adopted in 1976, designates the tank farm site and vicinity as a conservancy shorelines, having unstable shore features. The purpose of the Conservancy Environment is to protect, conserve and manage existing resources and valuable historic and cultural areas...to achieve sustained resource utilization. The preferred uses in this environment are nonconsumptive of the physical and biological resources of the area and uses of a non-permanent nature which do not substantially degrade the existing character of the area. The Master Program states clearly that industrial development ports are not permitted uses. This restriction is stated in the water use element and the natural systems section of the Master Program.

      The natural system section of the Program also prohibits excavation of Shoreline Cliffs at the base of a cliff, nor does it permit developments which tend to destroy or degrade the natural character of a shorelines cliff.

   d) The Draft E.I.S. does not address the relationship of the Oil Port proposal to the County Shorelines Master Program.

Each member of the Conference will submit a more detailed evaluation of the draft impact statement at the end of March. The above response is limited in scope only because the Conference is responsible under OMB A-95 requirements to review such projects in relation to local plans.

Thank you for the opportunity to comment.

Sincerely,

CLALLAM COUNTY
GOVERNMENTAL CONFERENCE

Russell Bayton
Russel Bayton
Acting Chairman

RB:JF:lw

L-21

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Anthony S. Earl
Secretary

BOX 7921
MADISON, WISCONSIN 53707

April 3, 1979

IN REPLY REFER TO: 1600

U.S. Department of the Interior
Bureau of Land Management
Oregon State Office
729 N.E. Oregon Street
Portland, Oregon 97208

Re: Draft Environmental Statement - Crude Oil Transportation System. Port Angeles, Washington to Clearbrook, Minnesota (as Proposed by Northern Tier Pipeline Company).

To Whom it May Concern:

The Department submits the following comments for your consideration. These environmental concerns would apply if the proposed Northern Tier Pipeline is not constructed.

1. The Upper Mississippi River Basin Commission is in the process of preparing a master management plan for the Mississippi River. This is a comprehensive plan developing long-range utilization schemes and objectives for the Mississippi River. It will take into consideration environmental, developmental, dredging, barging and transportation concerns. An unplanned substantial increase in river transportation, as a result of increased crude oil shipments, could significantly impact existing or proposed goals and plans.

2. Railroads could be utilized as alternate or supplemental transportation modes, although the existing lack of adequate tanker cars may preclude this alternative. In addition numerous railway lines are under abandonment schedules.

   We anticipate numerous impacts if increased railway transportation is utilized;

   a) Older lines would have to be upgraded so that they are capable of accomodating heavier loads, increased usage or greater speeds. The disposal of old railroad ties and upgrading of existing right-of-ways may affect sensitive environmental areas.

   b) Derailment of trains coupled with an oil spill could have disastrous impacts. Due to the remoteness of most lines containment may be extremely difficult, if not impossible. Environmental damage could result long before containment or clean-up operations begin.

3. The utilization of large ocean-going tankers on the Great Lakes could significantly impact existing Wisconsin ports and Lakes Michigan and Superior.

   a) Additional traffic would increase the potential for oil spills and subsequent environmental degradation.

   b) A lack of existing storage space at existing ports would require:

      1) The identification and conversion of sites from existing land use to storage capabilities.

      2) Dredging of harbors to accomodate large draft tankers. Harbor dredge spoils are oftentimes polluted and would need to be disposed of in a suitable containment site.

   c) Subsurface pipelines would have to be constructed in order to unload deep draft tankers.

   d) New areas which are not presently being utilized as ports would have to be located and modified for use for unloading and storage.

4. Expanded use of tanker trucks for localized and long distance transportation could compound air quality violations. This would be especially true in urban areas presently experiencing nonattainment with air quality limitations.

5. Construction or expansion of crude oil refineries within Wisconsin could impact localized areas.

We thank you for the opportunity to comment on this Draft Environmental Statement. Could you please forward us one copy of the Final Statement when it is completed.

Sincerely,
Bureau of Environmental Impact

Howard S. Druckenmiller
Director

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L-22

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
P.O. Box 2417
Washington, DC 20013

APR 2 1979

1950

Mr. Murl Storms
State Director
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Storms:

We appreciate the opportunity to comment on the Crude Oil Transportation System (Northern Tier Pipeline Company) Draft Environmental Statement. Our general comments are included in the body of this letter and the technical review notes are enclosed. Most of our observations concern the pipeline assessment.

1. We recommend the inclusion of specific corridor description and impact evaluations. Many of the resource descriptions and impact assessments are too broad to permit a corridor-specific evaluation. The impact assessment for one corridor segment is very similar to that for an alternative segment. As a result, distinctions between alternatives based on the extent, intensity, significance or cumulative effects of impacts cannot be made.

① 2. The summary table starting on page 8-95 should carry alternative corridor segment to a common end point. This is necessary to assess the total impacts associated with a corridor. The three Montana corridors provide an example. Active fault zones are discussed in the Ninemile Creek-Helena alternative. However, the other two corridor segment descriptions stop at Helmville, prior to reaching their end points. Complete corridor descriptions would indicate similar fault zones or other additional impacts for both segments.

② 3. This statement should be updated to reflect the recommendations made in the Forest Service RARE II Final Environmental Impact Statement. The nonwilderness allocated areas become available for nonwilderness uses on April 15, 1979.

③ 4. The Forest Service is responsible for the cultural resource requirements on National Forest System (NFS) lands. In the DEIS, it appears the Bureau of Land Management is accountable for cultural resource management on NFS lands. This should be clarified.

In summary, we feel that the environmental impact statement should contain the information necessary for the land managers and the public to thoroughly understand the impacts and trade-offs associated with this project.

Sincerely,

R. MAX PETERSON
Deputy Chief

Enclosure

TECHNICAL REVIEW COMMENTS

| | Page | Location | Comment |
|---|---|---|---|
| ④ | 1-13 | Figure 1.4-3 | It appears that the slope of the tank farm is towards the ocean and/or the creek, with the holding basin designed to hold the contents of one tank plus runoff from a major 24-hour storm. The concept of sloping this basin away from the ocean and creek should be assessed. The diked area could hold oil from multiple breaks, or, if a dike was flooded, the oil would be on land and not running into the water. |
| ⑤ | 1-39 | Table 1.4-17 | Note at bottom states mbf = million board feet. The "m" equals thousands. |
| ⑥ | 1-44 | 4th Paragraph | Pipe is to be transported in 40- to 80-foot lengths. Many of our existing roads cannot handle these lengths without significant reconstruction. Switchbacks and sharp curves quite often prevent transporting of loads in excess of 32 feet. The transporting of shorter pipe lengths should be considered for specific roads. |
| ⑦ | 1-44 | 16th Paragraph | States that on some road crossings only half the road would be dug up at a time. This does not sound practical on the narrow rural roads commonly encountered. Traffic certainly wouldn't be permitted on the undisturbed half of a 14- or 16-foot road while the other half was excavated. |
| ⑧ | 2-93 | Picture No. 4 | The two pictures numbered 4 are described as being typical of western Montana and eastern North Dakota. Should this be eastern Montana and western North Dakota? |
| ⑨ | 2-98 | 1st Paragraph | States that the Clark Fork is in Idaho rather than Montana. |
| ⑩ | 2-116 | Segment 6 | Indicates there is only one crossing of the Clark Fork. There are two additional crossings with one being multi-channel. |
| ⑪ | 2-139 | 2nd Paragraph | None of the adjacent roadless areas have been recommended for wilderness classification or for further study. |
| ⑫ | 2-153 | 12th Paragraph | The proposal has generated a great deal of controversy outside the Port Angeles area. |
| ⑬ | 2-161 | Last Paragraph | Indicates that Prospect Creek and Clark Fork are located in Idaho. |
| ⑭ | 2-163 | Plummer to Plains | Will need to reflect the recommendations contained in the RARE II FES. |
| ⑮ | 3-67 | 6th Paragraph | The ground water impacts are not consistent with what is stated on page 5-16 (1st paragraph) or page 7-2 (4th paragraph). There may be considerable impact on perched water tables that are used for domestic and irrigation needs, which is not uncommon in western Montana. |
| ⑯ | 3-84 | 3rd Paragraph | Discussion of threatened and endangered species and unique habitats not clear. What is the likelihood that the inspector will be a botanist? |
| ⑰ | 3-100 | --- | Segments 4, 5, and 6 differ in milepost designations from page 2-116. |
| ⑱ | 3-101 | --- | Segments 7 and 8 overlap by 42 miles. |
| ⑲ | 3-102 | --- | Mileposts for Segment 11 differs from page 2-117. |
| ⑳ | 3-119 | 1st Paragraph | Reference to antagonism on the Flathead Indian Reservation does not reflect the situation properly. |
| ㉑ | 3-119 | 7th and 9th Paragraphs | The percentages do not agree with those presented by Mountain-West Research to the Energy Planning Division, Montana Department of Natural Resources and Conservation, on January 16, 1979. At that meeting, Mountain-West Research stated that 60 percent of consumption expenditures were local; 60 percent of nonlocal workers were married; 33 percent brought their family and averaged 1.2 children per family. For every pipeline worker, there will be .3 others accompanying him. Commuting zone is +30 miles. |
| | | | The reference cited has the wrong date, either here or on page R-6. |
| ㉒ | 4-2 | Section 4.4 | The surface fault rupture discussion on page 3-60 indicates a high potential for pipe rupture for at least one area. There are no mitigating measures identified. The possibility of relocating the line to avoid crossing a fault, or the possibility of crossing the fault in areas where overburden will cushion the shock should be addressed. The discussion should also include special equipment and procedures th[illegible] would reduce impacts of spills, such as sh[illegible] valves on each side of the fault zone. |
| | 4-9 | 1st Paragraph | The reference to the Forest Service designating special camping facilities has been interpreted in published editorials and reports to mean the Forest Service will build special facilities. Editorial by Mavis McKelvey, Missoulian, February 27, 1979: "According to the EIS, in addition to the Forest Service (that has agreed to "establish special campgrounds" to take care of the expected "immigration of workers") and the Department of Energy, five other Federal agencies are expected to pay for pipeline impacts." In an information packet by the Environmental Information Center, it is stated: ". . . for the construction of special campgrounds by the Forest Service." Suggest rewording to correct this misinterpretation. |
| ㉓ | 5-13 | 10th Paragraph | The estimated 5 percent loss in soil productivity is low when considering that compaction, mixing, erosion, and earlier drying will all occur. |
| ㉔ | 6-2 | 9th Paragraph | States that lands will be converted to exclusive project use. Does this relate only to the pumping stations and delivery facilities? |
| ㉕ | 6-2 | 10th Paragraph (Last) | What is meant by: "Such commitments have already been made . . ."? |
| ㉖ | 6-3 | 2nd Paragraph | Impacts on the timber resource would be long-term. The productivity of timber is removed for the life of the project. |
| ㉗ | 6-3 | 8th Paragraph | It is stated that long-term reductions of fish productivity could result. The long-term is not supported by evidence presented in Chapter 3. |
| ㉘ | 7-2 | 2nd Paragraph | States that it takes 8 to 10 years for the oil to break down. Page 3-66 presents scenarios of as little as one year. If the circumstances relating to the 8-10 year period are different, these should be stated. Page 7-4 notes a 5-year period. |
| | 7-2 | 4th Paragraph | "Degradation of groundwater sources could last for several years." This statement is not supported on pages 3-67 or 5-15. |
| | 7-3 | 1st Paragraph | ". . . absolute loss of commercial and noncommercial forest vegetation . . ." is not supported in the ES. This would be true only for the tree portion of the forest vegetation. |
| | 7-3 | 4th Paragraph | "Construction of the pipeline would result in degradation . . . for the duration of the project." This is not supported in the ES. On page 3-84, it is stated that habitat alterations can be beneficial. Browse/cover ratios may be improved or browse production may be increased. Individual animals may be irretrievably lost, but the species as a whole should suffer little impact (an exception may be threatened and endangered species). |
| | 7-3 | Last Paragraph | The visual resource would not be irretrievably lost in agricultural lands and most range lands. |
| | 7-4 | 1st Paragraph | The visual resource impacted by an oil spill would not be an irretrievable/irreversible loss, especially in light of the definition of terms on page 7-1. |
| | 7-4 | 7th Paragraph | Oil spill risk on recreation is written in terms of short-term/long-term, not irretrievable/irreversible. |
| | 7-4 | 9th Paragraph | The loss of life statement is not supported in the DES. If the pipeline construction and operation industries experience an inordinate amount of loss of life or limb, then this would require supporting data. |
| ㉙ | 8-4 | 8th Paragraph | The "Major environmental impacts on . . ." is not supported in the discussion of the Jackass Ridge route starting on page 8-71. Construction in the Kings Pass area is not more difficult than most of the mountainous terrain crossed by the route. Areas of very high construction difficulty and resource impact, such as Siegel Creek (Ninemile alternatives), should be cited. |

CONT

| | Page | Location | Comment |
|---|---|---|---|
| ㉚ | 8-48 | Table 8.4.1-8-1 | Freshwater Bay/Social and Economic Conditions: Spill impact on the Lower Elwha Indian fishery is noted twice. |
| | | | Low Point/Social and Economic Conditions: The avoidance of industrial development is not a condition associated with the Low Point alternative. |
| ㉛ | 8-71 | Table 8.4.2.7 | Jackass Ridge: There are several references to the RARE II Area No. 1-139 and the conflicts or impacts that a pipeline would impose on this area. The area has been recommended for nonwilderness management and, as of April 15, 1979, the RARE II status will have no significance. The Panhandle National Forests does not see that the roadless status presents any significant barrier to the consideration of this alternative. |
| ㉜ | 8-75 | 1st Paragraph | The route clearing will be visually evident in the Beaver Creek and Kings Pass-Murray areas, in addition to the Kingston area. |
| ㉝ | 8-77 | 1st Paragraph | The construction is going to make a permanent drainage alteration in Siegel Creek. |
| ㉞ | 8-77 | 10th Paragraph | The high impact areas addressed in the Forest Service assessment are not noted. |
| ㉟ | 8-96 | Table 8.4.2-11-1 | Idaho(former proposed route)/Wildlife: Would there be a significant impact to the goose nesting grounds and, if so, would it be greater for this route over the others? |
| ㊱ | 8-96 | Table 8.4.2-11-1 | Jackass Ridge/Vegetation: It notes that there could be threatened and endangered plants in the corridor. On page 8-73, it is noted that there aren't any threatened and endangered plants in the corridor. |
| ㊲ | | | Jackass Ridge/Cultural: It is odd that more historical sites are located along the ridge route than along the river route. |
| ㊳ | | | Jackass Ridge/Social and Economic: Significant impact to forest lands is noted but not supported in previous discussion of this route. |
| ㊴ | 8-97 | Table 8.4.2-11-1 | Montana Routes/Topography-Geology: The Ninemile Creek-Helena alternative notes that active faults are crossed, but fails to note that the other two routes, in continuing east, would also have to cross these faults. This is due to the descriptions of Plains-Helmville and Ninemile Creek-Helmville stopping at Helmville. |
| ㊵ | | | Montana Routes/Vegetation and Land Use: The impacted acreages noted under Vegetation and Land Use do not agree with each other. |
| ㊶ | | | Plains-Helmville/Social and Economic: No mention is made of the Salish and Kootenai Tribal Council's ruling against the project. |
| ㊷ | | | Ninemile-Helena/Wildlife: Bald eagle and potential peregrine falcon habitat exist along the route. Same comment for the Ninemile-Helmville route. |
| ㊸ | | | Ninemile-Helmville/Social and Economic: Notes that short-term housing and services impacts would occur in Sanders and Missoula Counties. This would be equally as true in the other two alternatives. |
| ㊹ | --- | Table 8.4.2-11-1 | General observation. Impacts that may be common to all the alternative segments in a given area are listed only for one of the alternatives. This gives the impression that the impact is limited just to the corridor specified. The Cultural and Social and Economic resources are the most noticeable in this respect. |
| ㊺ | R-8 | --- | The Environmental Assessment on the Northern Tier Pipeline Proposal on National Forest System Lands, August 1978, is missing from the References Cited appendix. Reference is made to this report in the text. |

㊻ On page 1-24 it is noted that scrapers will be sent through the line to remove solids. Are there any impacts associated with disposal of these solids?

㊼ Several references made in the text to the map addendum are citing the wrong map.

L-23

Helmville, Montana 59843
April 4, 1979

BLM - Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon

Dear Sir,

I am writing this letter to express to you personally, my vehement disapproval of the Northern Tier Pipeline Project as a whole, as well as my objection to the proposed Ovando to Helmville area alternate route. My objection is based on a multiplicity of factors which I would like to briefly summarize.

I. Economic - the detremintal economic influences are well documented. We need only to look to the Alaskan Pipeline for undeniable proof. Schools, businesses, utilities, etc. are overwhelmed by a sudden influx of transient labor and are totally unable to meet even fundamental needs for food, power, housing, sewerage, recreation, etc. The fragile economic status of the many small communities (ie Helmville) in the path of the proposed pipeline would be shattered. What do we get for our sacrifice? Do we get cheaper oil, gasoline, heating fuels, etc.? People outside these communities reap the long term gains, while we are left with a transient financial gain and long term visual eyesore. Those of us who give up the most get the least! I object strenuously to this kind of logic.

II. Environmental - I personally see no way for this pipeline to be anything but environmentally disastrous. The findings in the Draft Environmental Statement seen to make this an undeniable fact. Unnecessary distrubance of pristine wilderness, wildfowl habitat, wild game ranges and valuable fisheries resources seems to high a price to pay. Our industrial history should provide us with adequate evidence of what can happen when we destroy our rapidly shrinking remote areas in the name of progress!!

III. Sociologic - I believe that this may be the most significant detriment of all. We who live in these areas enjoy a quality of life which is already rare. We enjoy clean air, clean water and clean living. The small community is a place of sharing, personal involvement, people who care about each other and a slow pace of life. Do you dare leave your home and automobile unlocked? The problems associated with this type of development have no place in our rural communities, for the scars may never go away.

These are just a few of the reasons I oppose the Northern Tier Pipeline, and thank you for your time and consideration in this issue.

Sincerely,

Adele Caughlan
Postmaster
Box 78

cc, President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee
Dept. of Natural Resources & Conservation
Governor Tom Judge

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L-24

**Williston Basin Regional Council For Development**
512 Fourth Avenue East
Williston, North Dakota 58801

Telephone (701) 572-[illegible]

[illegible]

April 2, 1979

Bureau of Land Management
Northern Tier Project
Room 1230, Lloyd Building
700 NE Multnomah
Portland, OR 97232

Dear Sir:

I am writing in follow up to my testimony at the public hearing of March 8 at the Farm Credit Community Room in Williston, North Dakota. The over all concern of the Williston Regional Basin Council is that the Northern Tier Crude Oil Pipeline construction may well be occurring at the same time as other major impacts are occurring in the Williston Basin area. Specifically, at the present time there is significant oil development occurring all across western North Dakota and eastern Montana. Williston is the regional service center for this oil activity. It appears that the present level of oil development in the area will be picking up and continuing for at least another five years and probably ten or more years. This current energy development is already significantly impacting the region's economy and services.

Housing anywhere in the region is very tight. Vacancy rates range from zero to one percent. Mobile home court space is also very limited in the region. On the east side of Williston there is a new mobile home court in the development stages; however, the sewer services to these trailer court lots will not lend itself to short term use as use of individual septic tanks is contemplated. The Regional Council will work with the Northern Tier Pipeline Construction Company to seek suitable housing for the period of construction.

It should also be noted that the availability of labor in the region will also be severely limited. The average unemployment rate for the region in 1978 was 3.3 percent. Over the period of the year the unemployment rate ranged from a high of 4.5 percent in January to a low of 2.2 percent in August.

Besides oil development there are a number of other activities which may overlap with the Northern Tier Pipeline Construction depending on the exact time of the Northern Tier Activity.

The summer of 1980 Williston will be hosting the National Babe Ruth Baseball League Tournament. This will bring approximately 800 baseball players and family members, not to mention, fans and so forth that would also be attracted to the city. This activity is particularly noteworthy because it will eliminate the possiblity of housing Northern Tier Construction work force in area family housing. Motel rooms normally quite full through the summer will be even tighter.

CONT

Another activity which will be occurring the summer of 1980 is the reconstruction of US Highway 85 about twenty miles south of Williston. This will be about a seventeen mile stretch of highway between Alexander, North Dakota and Arnegard, North Dakota. There will be approximately 30 to 50 construction workers employed for this project.

Another activity is the current construction of a regional warehouse for the Cenex Co-operative Company. This facility when it goes into operation will phase into employment approximately 100 employees. This will be occurring over a period of two or three years.

Some other activities which may also overlap with Northern Tier Pipeline Construction, should it be delayed, are the following:

1. The most significant is the Northern Border Pipeline Construction. This pipeline like Northern Tier will have a construction segment beginning out of the Williston area and another ending in the Williston area. Tentative plans are for the construction during the summer of 1981. This is a 48 inch pipe. It will be employing approximately 450 construction workers for each construction segment.

2. Another activity tentatively scheduled for construction in 1981 is the NAVSTAR Global Positioning System being developed by the United States Defense Department. This will involve several hundred employees in construction and in the operational phases. This facility will be located near Fortuna, North Dakota approximately ninety miles north of Williston.

3. Also looking east of Williston approximately fifty miles is the community of Tioga, North Dakota. Tioga Air Heaters Company, which presently employees about 40 persons, is anticipating doubling their employment in the next few years.

4. Another activity which is presently speculative but which could possibly move very quickly depending on how things go, is the development of a $60,000,000 gasohol plant somewhere in western North Dakota. This would be developed by a cooperative of area farmers.

The second concern is that Northern Tier may dry up the available labor supply for pipeline construction. At the present time there are anywhere from five to ten pipelines which are either being constructed, are in the development stages, or are being planned. These pipelines would be gathering lines or transmission lines of various kinds to serve the local oil field and utilities. The concern is that Northern Tier followed by Northern Border may significantly delay local pipeline construction, which is needed for the local oil industry, local rural water system, and local gas supply.

A third concern, which is longer term in nature and possibly outside the scope of this environmental impact statement, is that Northern Tier, together with a combination with other resources in the Williston area, may significantly contribute to the potential for development of synthetic processing of lignite into petrochemical products.

Enclosed is a map and brief information sheet listing these major resources which uniquely occur in the Williston area.

In reference to the draft environmental statement itself I would suggest the following changes.

1. On page 3-121 I would suggest that the second paragraph under "Population" be corrected to read " the influx would significantly impact remote rural areas. Eastern Montana and western North Dakota would have difficulty accomodating the work force. To a lesser degree central Washington and Minnesota would also be affected."

2. Also on the same page 3-121 under "Housing," I believe this paragraph should be modified to more accurately reflect the severe housing circumstances in western North Dakota.

3. On page 1-61 under Private Industries, I believe there should be some mention of the possible cumulative interrelationship of impacts generated by Northern Tier Pipeline followed by Northern Border Pipeline in western North Dakota. Specifically, there should be some mention of mitigating measures should Northern Border and Northern Tier be constructed through the area at the same time, or there should be mention of provision for one pipeline to follow the other in construction rather than both occurring at the same time.

Thank you for this opportunity for input and I would invite you to give us a call should you wish further information or explanation.

Sincerely,

WILLISTON REGIONAL BASIN COUNCIL

Richard O. Smith

Richard O. Smith
Acting Director

Enclosure
ROS/kjb
cc: Ralph Sandmeyer

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CONT

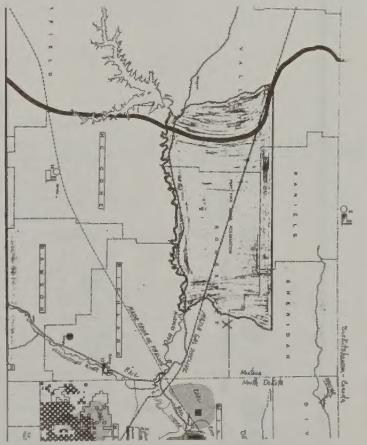
THE WILLISTON BASIN REGION IN THE FORT UNION
COAL FORMATION

The Fort Union Coal Formation (depicted on this map with bold outline) contains 40% of the total U.S. coal reserves. As can be seen from the map Divide, Williams, and McKenzie Counties (the Williston Basin Region) are directly in the center of the formation with coal development on all sides.

In considering major resources necessary or desirable for coal development in the Fort Union formation, Williams and McKenzie Counties consistently show up in the list. Furthermore, as counties are examined to contain a combination of resources, McKenzie County comes up repeatedly and Williams County is the only one to show up in every combination.

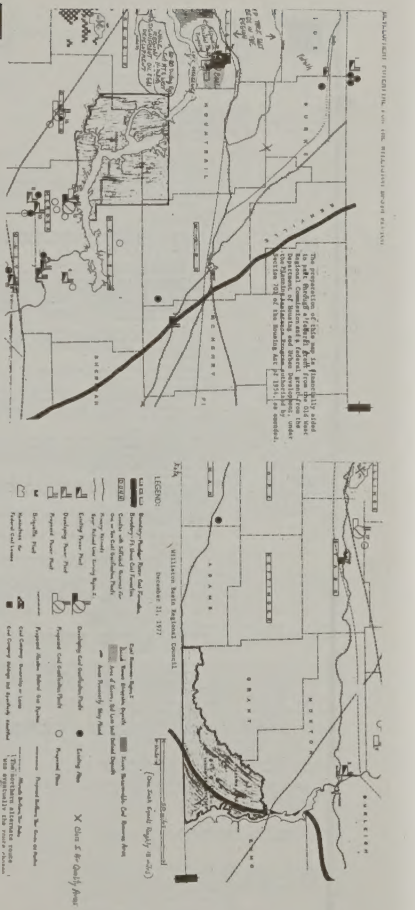
| | Resources Necessary or Highly Desirable For Coal Development | No. of Counties In the Region With The Resource | No. of Counties* In the Formation With The Resource |
|---|---|---|---|
| Single Resources | Enough coal for coal gasification plants | 2 | 18 |
| | On a major water source | 3** | 19** |
| | Served by major rail lines | 1 | 18 |
| | To be crossed by the Northern Border Pipeline (Alaskan Natural Gas) | 2 | 7 |
| | To be crossed by the Northern Tier Pipeline (Alaskan Crude Oil) | 1 | 7 |
| | Counties with cities 10,000 or more in population (Infrastructure) | 2 | 6 |
| Combinations of Resources | For any two resources | -2 | 10 or better odds |
| | For any three resources | 2 | 9 or better odds |
| | For any four resources | 1 | 3 or better odds |
| | For all five resources | 1 (Wms. Co.) | 1 |

*There are a total of 42 counties in the formation.
**McKenzie and Richland counties counted twice as they are served by both the Missouri and Yellowstone Rivers.
*** McKenzie County is included as it has Williston on its northern border and Sidney on its western border.



SUMMARY MAP OF COAL

CONT

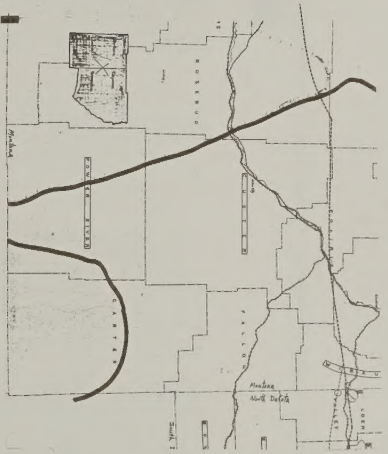

DEVELOPMENT POTENTIAL FOR THE WILLISTON BASIN REGION
DIVIDE
BURKE
RENVILLE
MOUNTRAIL
McHENRY
WARD
SHERIDAN
ADAMS
GRANT
HETTINGER
MORTON
BURLEIGH
EMMONS
TOP THICK SALT BEDS IN THE REGION
Lake Sakakawea
LEGEND:
Boundary-Powder River Coal Formation
Boundary-Ft. Union Coal Formation
Counties with Sufficient Reserves for One or Two Coal Gasification Plants
Primary Railroads
Spur Railroad Lines Serving Region I
Existing Power Plant
Developing Power Plant
Proposed Power Plant
Briquette Plant
Nominations for Federal Coal Leases
Coal Reserves-Region I
Known Strippable Deposits
Known Recoverable Coal Reserves Area
Area of Known, But Less Well Defined Deposits
Areas Previously Strip Mined
Developing Coal Gasification Plants
Proposed Coal Gasification Plants
Existing Mine
Proposed Mine
Class I Air Quality Areas
Proposed Alaskan Natural Gas Pipeline
Proposed Northern Tier Crude Oil Pipeline
Alternate Northern Tier Route
Coal Company Ownership or Lease
Coal Company Holdings Not Specifically Identified
50 miles
(One Inch Equals Roughly 18 miles)

The preparation of this map is financially aided in part through a federal grant from the Old West Regional Commission and a federal grant from the Department of Housing and Urban Development, under the Planning Assistance Program authorized by Section 701 of the Housing Act of 1954, as amended.

Williston Basin Regional Council
December 21, 1977

The northern alternate route was eventually the route chosen

L-24
CONT



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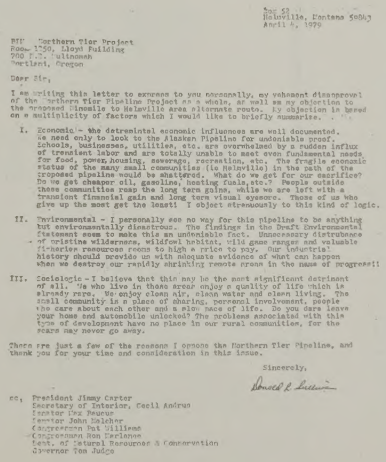
L-25



Box 52
Helmville, Montana 59843
April 4, 1979

BLM Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon

Dear Sir,

I am writing this letter to express to you personally, my vehement disapproval of the Northern Tier Pipeline Project as a whole, as well as my objection to the proposed Ninemile to Helmville area alternate route. My objection is based on a multiplicity of factors which I would like to briefly summarize.

I. Economic - the detremintal economic influences are well documented. We need only to look to the Alaskan Pipeline for undeniable proof. Schools, businesses, utilities, etc. are overwhelmed by a sudden influx of transient labor and are totally unable to meet even fundamental needs for food, power, housing, sewerage, recreation, etc. The fragile economic status of the many small communities (ie Helmville) in the path of the proposed pipeline would be shattered. What do we get for our sacrifice? Do we get cheaper oil, gasoline, heating fuels, etc.? People outside these communities reap the long term gains, while we are left with a transient financial gain and long term visual eyesore. Those of us who give up the most get the least! I object strenuously to this kind of logic.

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III. Sociologic - I believe that this may be the most significant detriment of all. We who live in these areas enjoy a quality of life which is already rare. We enjoy clean air, clean water and clean living. The small community is a place of sharing, personal involvement, people who care about each other and a slow pace of life. Do you dare leave your home and automobile unlocked? The problems associated with this type of development have no place in our rural communities, for the scars may never go away.

These are just a few of the reasons I oppose the Northern Tier Pipeline, and thank you for your time and consideration in this issue.

Sincerely,

Donald R. Sullivan

cc, President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee
Dept. of Natural Resources & Conservation
Governor Tom Judge

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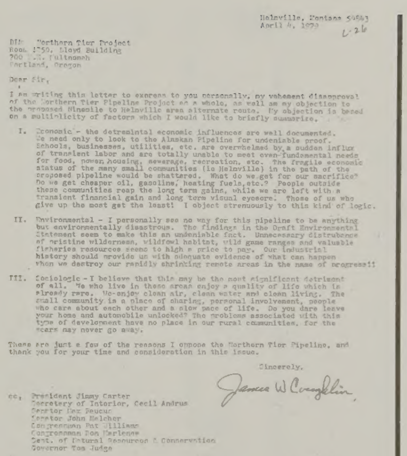
L-26



Helmville, Montana 59843
April 4, 1979
L-26

BLM Northern Tier Project
Room 1250, Lloyd Building
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Portland, Oregon

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Sincerely,

James W Coughlin

cc, President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee
Dept. of Natural Resources & Conservation
Governor Tom Judge

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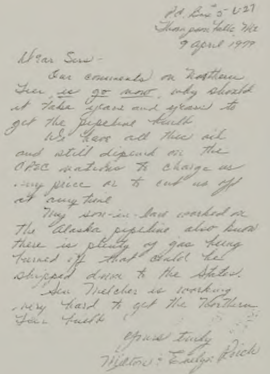
L-27



P.O. Box 5 - L-27
Thompson Falls Mt
9 April 1979

Dear Sirs -

Our comments on Northern Tier is go now, why should it take years and years to get the pipeline built.

We have all this oil and still depend on the OPEC nations to charge us any price or to cut us off at any time.

My son-in-law worked on the Alaska pipeline also knows there is plenty of gas being turned off that could be shipped down to the States.

Sen Melcher is working very hard to get the Northern Tier built.

Yours truly
Milton & Evelyn Rich

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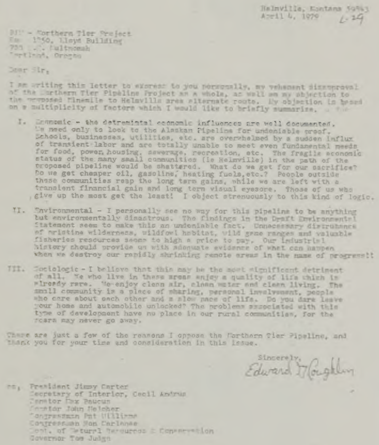
L-29



Helmville, Montana 59843
April 4, 1979
L-29

BLM - Northern Tier Project
Rm. 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon

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Sincerely,

Edward D. Coughlin

cc, President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee
Dept. of Natural Resources & Conservation
Governor Tom Judge

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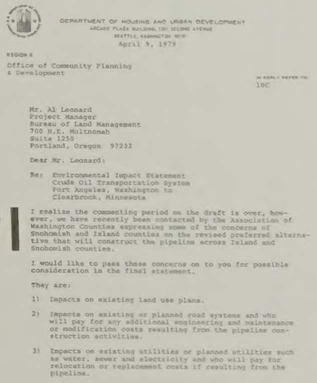
L-31



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
ARCADE PLAZA BUILDING, 1321 SECOND AVENUE
SEATTLE, WASHINGTON 98101

April 9, 1979

REGION X
Office of Community Planning
& Development

IN REPLY REFER TO:
10C

Mr. Al Leonard
Project Manager
Bureau of Land Management
700 N.E. Multnomah
Suite 1250
Portland, Oregon 97232

Dear Mr. Leonard:

Re: Environmental Impact Statement
Crude Oil Transportation System
Fort Angeles, Washington to
Clearbrook, Minnesota

① I realize the commenting period on the draft is over, however, we have recently been contacted by the Association of Washington Counties expressing some of the concerns of Snohomish and Island counties on the revised preferred alternative that will construct the pipeline across Island and Snohomish counties.

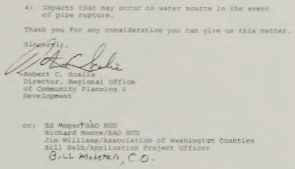
I would like to pass these concerns on to you for possible consideration in the final statement.

They are:

1) Impacts on existing land use plans.

2) Impacts on existing or planned road systems and who will pay for any additional engineering and maintenance or modification costs resulting from the pipeline construction activities.

3) Impacts on existing utilities or planned utilities such as water, sewer and electricity and who will pay for relocation or replacement costs if resulting from the pipeline.



4) Impacts that may occur to water source in the event of pipe rupture.

Thank you for any consideration you can give on this matter.

Sincerely,

Robert C. Scalia
Director, Regional Office
of Community Planning &
Development

cc: Ed Mogar/SAO HUD
Richard Moore/SAO HUD
Jim Williams/Association of Washington Counties
Bill Selb/Application Project Officer
Bill Holsten, C.O.

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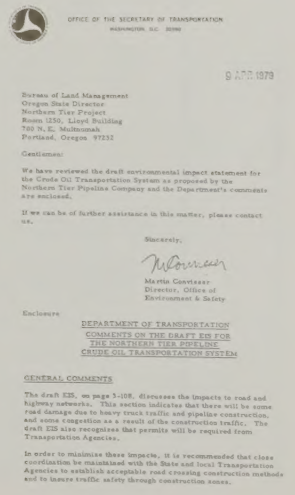
L-32



OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

9 APR 1979

Bureau of Land Management
Oregon State Director
Northern Tier Project
Room 1250, Lloyd Building
700 N. E. Multnomah
Portland, Oregon 97232

Gentlemen:

We have reviewed the draft environmental impact statement for the Crude Oil Transportation System as proposed by the Northern Tier Pipeline Company and the Department's comments are enclosed.

If we can be of further assistance in this matter, please contact us.

Sincerely,

Martin Convisser
Director, Office of
Environment & Safety

Enclosure

DEPARTMENT OF TRANSPORTATION
COMMENTS ON THE DRAFT EIS FOR
THE NORTHERN TIER PIPELINE
CRUDE OIL TRANSPORTATION SYSTEM

GENERAL COMMENTS

The draft EIS, on page 3-108, discusses the impacts to road and highway networks. This section indicates that there will be some road damage due to heavy truck traffic and pipeline construction, and some congestion as a result of the construction traffic. The draft EIS also recognizes that permits will be required from Transportation Agencies.

In order to minimize these impacts, it is recommended that close coordination be maintained with the State and local Transportation Agencies to establish acceptable road crossing construction methods and to insure traffic safety through construction zones.

L-32 CONT

In addition to the necessity of relocating our Port Angeles Very High Frequency Omnidirectional Range (VOR) facility, as outlined in Table 5.1.12-1 and Section 5.1.13 of the draft environmental impact statement, there may be other adverse impacts on Northwest Region air navigation facilities in Washington and Idaho. This could occur during the construction phase, depending on the specific route of the pipeline. The specific route cannot be defined, to the tolerance we would require for making that determination, from the information furnished in the draft environmental impact statement.

① Construction equipment working within the restrictive areas or penetrating certain vertical angles of antenna at facilities such as Very High Omnidirectional Range and Tactical Air Navigation Aids (VORTACs), Radar Microwave Link Receivers (RMLRs), and Air Route Surveillance Radars (ARSRs) could interfere with the radiated signal and render the facility unusable during those times the equipment is working in those areas. If this occurs, it will necessitate facility shutdown during those periods.

If the specific route of the pipeline passes through our leased or restrictive areas, it will be necessary for the contractor to obtain easements, or permission from us, as well as to maintain close coordination with us so that shutdown of affected facilities may be arranged on a timely basis.

We note that the summary draft environmental impact statement on Page 5 indicates that the Federal Aviation Administration has project approval requirements with reference to construction on or near airports. This is important to note since Pages 138-139 of the map addendum show that the proposed action would involve conflict and risk to air traffic in the Olympia area of Washington. This phase of the project should be thoroughly coordinated with FAA and this approval requirement should be emphasized in the final environmental impact statement.

Although NTPC currently proposes burying the pipeline below the streambeds of major streams and rivers, we wish to reiterate that should there be a change in these plans and pipeline waterway crossings are made by bridging, then Coast Guard bridge permits will be required.

From an operational standpoint the present location of Port Angeles Air Station on Ediz Hook is ideal. We are well satisfied with that location and desire very much to remain there.

② SPECIFIC COMMENTS

Page 1-1 The project description should state that shoreside portions at berthing facilities will be on land which is presently Federally owned.

Page 1-5 Under Activity Requiring Approval (Table 1-3-1) add for the Coast Guard: "The Coast Guard, acting as Federal Government agent for the Ediz Hook property, has authority to approve construction plans for all building on the premises." This comment also applies on page 1-60 under Coast Guard.

Page 1-11 The DEIS shows that a best case for a pipeline leak in the inactive condition would result in a 50 - 100 barrel spill before detection. The DEIS should consider the response time lag and effect of drainback due to the 100-foot change in pressure head.

The description of the leak detection system in the active phase is unclear. Based on the information presented, the detection device has an accuracy of 0.5% of pipeline capacity. One interpretation of this is the possibility of a 4,665 barrel spill before detection. No mention is made of possible leakage during shutdown or due to drainback. In addition, the DEIS should consider alternative approaches such as using double-jacketed pipes to reduce this spill risk.

Page 1-15 The description of the firefighting system should include how long the water supply for firefighting will last in the event of a major fire. Also, when will NTPC know whether onsite wells will be required to supply additional water?

Page 1-31 Once again the magnitude of possible spills should be detailed. With a 933,000 bpd system throughput, a 4,665 barrel spill could result before the two minute reaction time and drainback in the main pipeline will be considerable since check and block valves are usually at least ten miles apart.

Page 1-49 The discussion of the route of inbound tankers implies adequate anchorages are available. As discussed in a letter dated 11 August 1978 (Enclosure 1) from the Commander, Thirteenth Coast Guard District to the Bureau of Land Management (BLM), this would be an erroneous conclusion.

Page 1-54 Reference should be made to 33 CFR 154.300, which requires a facility operator to prepare and submit an Operations Manual detailing procedures for all possible occurrences. The facility may not be operated until this manual has been approved by the Coast Guard Captain of the Port (COTP).

Page 1-55 The DEIS should include amounts constituting a minor, medium or major spill. We suggest levels contained in the National Contingency Plan (40 CFR 1510) be utilized. Those levels are:

a. Minor discharge. less than 1,000 gallons in inland waters, less than 10,000 gallons in coastal waters;

b. Medium discharge. 1,000 to 10,000 gallons in inland waters, 10,000 gallon to 100,000 gallons in coastal waters; and

c. Major discharge. More than 10,000 gallons in inland waters, more than 100,000 gallons in coastal waters.

The last sentence on page 1-55 states minor spills generally cause minimal impact. This is conjecture and we suggest deleting that sentence.

Page 1-56 The outline of dispatcher activities in the event of a spill must include notification of the National Response Center at toll-free telephone number 1-800-424-8802. Also the

CONT ②

marine terminal seems to be the least desirable location for the NTPC fireboat since an explosion at that facility could render the fireboat unusable.

Page 1-58 Under item 27, there are no Coast Guard enforced Federal regulations directly governing tank vessel ballasting. The Coast Guard does provide vessels with a stability letter in accord with regulations governing the stability of U.S. tank vessels. This letter lists certain conditions which must be met to maintain adequate stability. The stability letter may require a vessel to take on a predetermined amount of ballast. However, specific ballasting policy is the result generally of operating practices or shipboard personnel perference, and not the result of Coast Guard regulations.

Page 1-60 We recommend adding under Coast Guard that in July 1979, the Coast Guard will commence a $2.5 million rehabilitation project at Port Angeles Air Station that includes installation of a freshwater deluge system in the aircraft hanger, construction of new public works and exchange buildings, remodeling of an existing barracks, and demolition of obsolete excess buildings.

Page 1-61 Under Trans Mountain Pipeline Proposal it is the Secretary of Transportation's interim navigation rule which prohibits tankers larger than 125,000 dwt from entering Puget Sound until permanent regulations are promulgated.

Page 1-63 Under Legal Constraints should be added the Ports and Waterways Safety Act (33 USC 1221 et. seq.).

③ Page 2-29 The description of property ownership on Ediz Hook is sketchy at best. It is difficult to visualize the extent of the Coast Guard property from the existing description. We suggest that enclosure (2) be added to the EIS to clarify property lines.

④ Page 2-32 Table 2.1.1.13-1 lists passenger and dry cargo, tanker, and towboat or tugboat as non-self-propelled vessels. This classification is incorrect. A review of the Corps of Engineers source document will clear up printing errors in the table layout.

⑤ Page 2-33 The label, "U.S. Naval and Military Reservations" should be changed to "U.S. Coast Guard Reservation." This also applies to page 3-44.

⑥ Page 2-38 Enclosure (3) is an updated version of Table 2.1.1.15-1 and should be included since traffic volume in the Strait of Juan de Fuca has increased significantly. Also, the narrative immediately following the table could cause confusion between traffic data to Port Angeles and that east of Port Angeles.

⑦ Page 2-52 The discussion of seismic activity is too casual, glossing over the passage through three distinct areas of historically severe seismic activity. A discussion of the risks and steps NTPC would take as mitigation should be included.

⑧ Page 3-6 Under Hydrocarbon Emissions, the fourth sentence of the first paragraph is vague. Before the effects of the emissions can be assessed, it is necessary to include the specific source and the amounts of emissions involved.

In the last sentence of the second paragraph of Hydrocarbon Emissions, additional information should be included or referenced to permit verification of the claim that 21% of the tankers would have no segregated ballast.

⑨ Page 3-16 & 3-17 There should be a discussion of the risks of a submarine pipeline break caused by the dropped anchor of a vessel maneuvering into Berth 2. We assume the submarine pipelines will be buried at least 48" below the harbor bottom. However, the possibility is significant that an anchor weighing several tons could penetrate a pipeline with a 48" cover.

⑩ Page 3-18 The analysis of oil spill movement by the Oceanographic Institute of Washington ( OIW) has not properly shown the movemement of oil on the water. The NOAA report on circulation in the Strait of Juan de Fuca gives a more realistic prediction of movement based on surface drifters. The OIW report fails to adequately depict the effect of a casualty on the Strait of Juan de Fuca and Puget Sound.

⑪ Page 3-39 The discussion of the displacement of the marine and boat ramp and its probable relocation to a less desirable spot in the harbor is vague. With the paucity of marina facilities for small boats and the heavy use of the boat ramp during the Salmon season, some suitable alternative for recreational boat use should be identified.

⑫ Page 3-41 The effects on the Coast Guard Group/Air Station from a fire, explosion, or oil spill are not adequately discussed. A "worst case" explosion, for example, would result in the loss of at least 81 Coast Guard personnel and millions of dollars worth of government property and equipment. The stated damage/injury radii are questionable. We refer to recent tanker explosions in Los Angeles and the North Sea. Both incidents caused severe damage to the adjoining areas and damaged buildings up to 20 miles away.

The narrative with respect to an oil spill severely understates the resultant effect. For example, the statement that a spill of 100 barrels or more (4200 gallons) would be required to cause effects on adjoining land is untrue. The present water quality of Port Angeles and its adjacent water is classified "extraordinary" and surely spills of less than 100 barrels would have a noticeable effect.

⑬ Page 3-42 The discussion of effects on anchorages should include safety and economic considerations. The reference to a "proposed" restricted anchorage should be changed to "possible" restricted anchorage.

The section, Construction Phase, should include economic effects as well as the inconveniences that will be experienced through laying the submarine pipeline.

CONT ⑭

Page 3-43 Under Road and Highway Networks, we suggest including a discussion that for all three phases, activities associated with the oil transport terminal could hinder Coast Guard personnel in returning to the air station for emergency recalls to duty, thereby reducing Coast Guard mission effectiveness. Also, the artificial lighting associated with terminal facilities will severely impair Coast Guard air crews' "nightvision," creating serious safety hazards. The same consideration applies to Coast Guard boat crews stationed at Ediz Hook and should be included under Inland Water Transportation on page 3-42.

⑮ Page 3-46 Air Transport-It should be noted the proposed project will also restrict use of the Port Angeles Air Station facilities by the Boeing Commercial Airplane Company and Pearsom Aircraft, Inc. Both companies have Coast Guard permits to land at Ediz Hook when inclement weather has forced the closing of Fairchild Airport.

⑯ Page 4-3 Under Possible Federal Requirements, "Vessel Traffic System" should be "Vessel Traffic Service". The Puget Sound VTS will cover the Strait of Juan de Fuca, in cooperation with Canada, by 1981. This system will be capable of handling the projected increased tanker traffic generated by the proposal.

Page 4-6 Section 4.12.2 outlines pipeline-inspection criteria set by the Office of Pipeline Safety. It appears possible that a small leak below the detection threshold would continue for two weeks before detection, thereby causing a major oil spill with severe effects. This consideration should be included in the analysis of oil spill risk, since even the smallest pipeline spill would exceed response capabilities immediately available (i.e., containment, removal, mitigation, disposal).

Page 4-6 & 4-7 Under Potential Additional Mitigation Measures with respect to the eastward movement of the berthing facilities, it would be impossible for the Thunderbird Marina and public boat ramp to function continuously during the project's operation phase because of the ignition-source problems small boats present to off-loading tankers. The expressed willingness of NTPC to relocate eastward along Ediz Hook would severely impair Coast Guard Air Station operations. As stated in the EIS, the Coast Guard has expressed no willingness to relocate, hence this measure cannot be considered mitigating. No alternatives have been considered.

⑰ Page 5-9 In Table 5.1.12-2, we feel the possible effects of fire or explosion on the Coast Guard Air Station are once again understated.

⑱ Page 6-4 While the proposal addresses construction of two berths, a third berth would have extremely adverse effects on the Coast Guard Air Station which will require a thorough analysis.

⑲ Page 6-5 Figure 6.3.2-1 should reflect the change required in the location of the fuel barge service platform if the proposed third berth is added.

⑳ Page 8-30 Figure 8.4.4-1 should show the Strait of Juan de Fuca Traffic Separation Scheme so as to detail the close proximity of inbound commercial traffic to the single point mooring sites at Low Point and Freshwater Bay.

㉑ Page 9-10 The Ports and Waterways Safety Act should be added to the list of Federal statutes.

Encl: (1) Commander, Thirteenth Coast Guard District (dpl) ltr to Bureau of Land Management dated 11 August 1978
(2) Clarified property lines
(3) Updated version of Table 2.1.1.15-1

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DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
COMMANDER (m)
THIRTEENTH COAST GUARD DISTRICT
915 SECOND AVE
SEATTLE, WASH. 98174
PHONE 442-5537

| | ROUTING | | | | | DATE | |
|---|---|---|---|---|---|---|---|
| | SLE | AWLE | SLE-1 | SLE-2 | SLE-3 | SLE-4 16672 | |
| ACT | | | | | | | |
| INFO | | | | | | | |
| FILE | | | | | 8/15 | | |

1978

Mr. Frank Hamerski
Northern Tier Pipeline EIS
Project Manager
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Hamerski:

In response to your letter of 3 July 1978, the following information is provided:

1. The Northern Tier Pipeline marine terminal, submarine pipeline and attendant increase in tanker movements, will have a substantial impact on harbor traffic in the vicinity of Port Angeles. The additional 300 tankers per year, some as large as 300,000 DWT, will cause an overload of vessels anchoring in the inner harbor awaiting pierside accomodations both at the Northern Tier facility and other facilities within Puget Sound. Pleasure and fishing craft would not be allowed within a predetermined distance of transferring tankers as a preventive measure against ignition of the vapors present during transfer operations. Additionally, establishment of a restricted anchorage area along the submarine pipeline route across Port Angeles Harbor to the proposed storage site at Green Point is being considered by the Coast Guard. Concern has been voiced by the Director, Northwest Region for the Federal Aviation Administration with respect to the anchoring of large vessels within a 4000 foot semi circle of the VOR site on Ediz Hook. It is recommended that the FAA be afforded the opportunity to comment on the NTP proposal and how it might impact on aircraft safety. Mr. Jess Tanner, Deputy Director, Northwest Region (206)-767-2780 is the proper contact.

CONT

The aggregate effect on these infringments is the restriction of marine traffic activities within the harbor of Port Angeles. Enclosure (1) depicts the proposed encroachment.

2. The Northern Tier proposal for Berths 1 and 2 appears to have no impact on Coast Guard operations; however, the planned expansion to include Berth 3 would significantly impact on Coast Guard vessel and air operations.

## ENCLOSURE(1)

As shown by enclosure (1) the location of proposed Berth 3 would severely inhibit ingress and egress of Coast Guard vessels. Additionally, the location of large tankers moored immediately adjacent to the terminus of the CG Port Angeles Air Station runway is considered unsafe and will adversely impact on Coast Guard air operations.

a. An increase in two enlisted Coast Guard Marine Safety personnel could be anticipated to conduct the tank vessel boarding program. Pay grades of E-5 and/or E-6 are anticipated.

3. Average daily vehicular traffic to and from the Coast Guard station is 375 cars. The average daily water consumption for the Air Station is 5586 gallons, with an additional 2500 gallons utilized when the CGC CAMPBELL is moored adjacent to the Air Station.

4. The Puget Sound Vessel Traffic Service would have to be modified so that the present voluntary Traffic Separation Scheme in the Strait of Juan de Fuca would be included in the mandatory vessel traffic service to insure an adequate level of marine safety. It should be noted that preparations for this move are already in progress through negotiations with the Canadian government on the Department of State level.

5. In addition to the Marine Safety considerations the following Coast Guard concerns for bridging navigable waterways exist:

a. Bridge permits will be required for all overhead pipeline crossing navigable waterways;

b. If a waterway listed for crossing has not had a navigability determination made, and the waterway will be bridged, a determination must be requested from the Coast Guard;

c. Environmental documentation to support bridge permit applications is required. The Coast Guard will accept other federal agency documentation so long as Coast Guard concerns are addressed in the document. This is usually accomplished by Coast Guard input into the pre-draft EIS statement, thus expressing our concerns and permit requirements in the Draft and Final EIS Statements. This procedure can well avoid a supplemental statement after the Draft and/or Final EIS Statement has been issued. Coast Guard concerns with respect to overhead stream crossings are generally limited to providing for navigation requirements and/or any in-water disturbances caused by construction or maintenance of the bridges. Other impacts beyond the waterway, the bridge, and approaches are generally accepted by the Coast Guard when addressed by the lead agency.

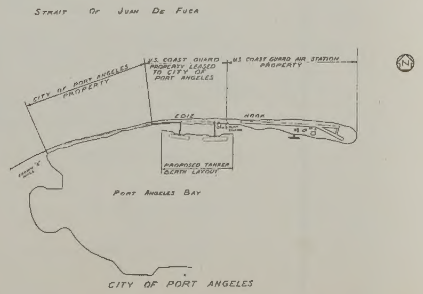
d. The requirements of the DOT Act (PL 89-670) (Section 4(f)), are explicit for the use of any land from a public park, recreation area, wildlife and waterfowl refuge or historic site. If these lands are to be utilized for a bridge crossing then a Section 4(f) Statement will be required. The Statement must show there is no feasible and/or prudent alternative to the use of such land and the final selected alternative must include all possible planning considerations to minimize harm resulting from such use. In the event 4(f) lands are to be utilized for the bridge crossings then preparation of the Statement will be done by the Coast Guard. This Statement should be prepared as soon as possible to prevent delay to any other procedures. The information on the alternatives being considered must be furnished by the bridge permit applicant.

Sincerely,

Richard F. Malm
RICHARD F. MALM
Captain, U.S. Coast Guard
Chief of Staff
Thirteenth Coast Guard District

Copy to:
Air Sta. Port Angeles
COTP, Seattle
PSVTS, Seattle
COMDT (G-WLE-7) w/o encl.

Encl: (1) Annotated Chart 18468 of Port Angeles, WA


STRAIT OF JUAN DE FUCA
CITY OF PORT ANGELES PROPERTY
U.S. COAST GUARD PROPERTY LEASED TO CITY OF PORT ANGELES
U.S. COAST GUARD AIR STATION PROPERTY
N
EDIZ
HOOK
PROPOSED TANKER BERTH LAYOUT
PORT ANGELES BAY
CITY OF PORT ANGELES

**L-32 CONT**

TABLE 2.1.1.15-1 VESSEL ACTIVITY-STRAIT OF JUAN DE FUCA, 1978

| | TOTAL | AVG/DAY |
|---|---|---|
| ALL VESSELS | 18,154 | 49.8 |
| FREIGHTERS | 8,318 | 22.8 |
| TANKERS | 1,343 | 3.7 |
| TUGS | 3,856 | 10.6 |
| FERRIES | 2,034 | 5.6 |
| GOVERNMENT | 2,231 | 6.1 |
| MISC. | 400 | 1.1 |

SOURCE: U. S. COAST GUARD 1979

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**L-34**

Harry E. Wilbert, P.E.
P. O. Box 303
Freeland, Wash. 98249
(Whidbey Island)

11 April 1979

The Bureau of Land Management
1250 Lloyd Building
700 N.E. Multanomah Ave.
Portland, Oregon 97232

Gentlemen:

Recently I received a section of the "Draft of Environmental Impact Statement for Northern Tier Pipeline Location in Island County, Washington." I am making comments even though it is difficult to impart quality statements because the document is vague and not applicable to Island environments.

Upon retirement 10 years ago, I moved to Whidbey Island where I have become familiar with local conditions. In my profession, I had extensive experience with ground water and pollution from various sources. That is the reason I am so concerned with three aspects of the pipeline plan: (1) Oil leakage into Island water supply; (2) Oil leakage from under sea pipeline; (3) And local alignment overland.

My most important concern is the effect of small, undetected leaks in buried pipeline on county underground water supply system.

It is an uncontested fact there there is some leakage in any pipeline. Island County, with the exception of Oak Harbor, depends upon a limited amount of ground water stored in the residual gravels of Vashon Glacier. A relatively impervious glacial till covers the surface and reduces the recharge characteristic of the soil. A rainfall of 18 inches to 22 inches over much of the county, creates still further limiting factors on water availability.

Contamination of the water, even to a slight degree, would be an economic disaster for the affected area. The only source of replacement water supply would be via a long, expensive water pipeline to some point on the Skagit River. It would be impossible to remove oil from the underground gravels once it is there.

We could expect the oil pipeline company to resist prompt settlement for damages caused by their operation. The occurrences of small areas of pollution will cause ill feeling and legal suits by area residents during most of the life of the facility.

Public meetings have been held with representatives of the U.S. Geological Survey Dept. regarding updating a detailed geological report and water supply study. (See Attached News Release.) This survey was estimated to cost up to $6-hundred-thousand. The need for such a study was never questioned. Financing such a study still remains a problem.

My recommendation on first item is that a proper geological and water supply report on underground water be completed and incorporated into the draft of E.I.S. The Northern Tier Pipeline Co. should furnish a major portion of Island County's cost of the finished document.

Second concern is the affect of underwater oil leaks on bottom fish, which are becoming more valuable for both commercial and recreational catch. These fish do NOT migrate as do salmon. Both dredging of ocean floor and regular small amounts of oil leakage would have a lasting detrimental affect, if not complete annihilation of fish, their spawning grounds and their food supply.

I, therefore, recommend that this problem should be explored and reported in much greater depth than given in the present draft.

Also note that pipeline leaks, either under water or above ground in ground water storage basins, are more serious than spills from tankers. Comparison between pipeline leaks and tanker spills should not be made on volume of oil lost.

My third concern is regarding part of the alignment plan. There is a growing need for a bypass of State Highway 525 around the City of Oak Harbor. Sect. 19, T32N, R1E, and Sect. 24, T33N, R1E, should be considered for joint occupancy of the pipeline and limited access highway, bypassing Oak Harbor. This action would reduce unfavorable impacts on adjoining property and be of ultimate benefit to the community.

I recommend that a detailed report on this bypass be obtained from Washington State Highway Dept.

Yours truly,

HARRY E. WILBERT, Col. (Ret.)
USArmy Corps of Engrs.
Harry E. Wilbert, P.E.
P. O. Box 303
Freeland, Wash. 98249
(Whidbey Island)

HEW/m

Enclosures (2) News/Reg. No.2341

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**L-35**

P.O. Box [illegible]
Helmville, Montana 59[illegible]
April 7, 1979

[illegible] Northern Tier Project
Room 1250, Lloyd Building
[illegible] Multnomah
Portland, Oregon 97232

Dear Sir;

As I write, with great concern over the Northern Tier Pipeline, my [illegible] feelings are strongly opposing such a proposal for this area of Montana, and what might follow.

This valley in which we live, bordering the Bob Marshall Wilderness, is a valley of few. Other's are rapidly being destroyed by [illegible] I cannot sit back and let this land of my ancestors and wildlife that protected and cared for be destroyed, so generations to follow might never be exposed to some beauty in life.

How many places are left where people at anytime of the year, can drive, walk, or just sit and see wildlife? Deer, elk, bald eagle, bear, osprey, beaver, mink, otters, bobcat, native fish! I could go on and on listing different species of animals, birds, etc. This land, which is being threatened by the possible impacts of proposed [illegible] and Colstrip Power lines etc. to follow, is breeding and nesting grounds for many species of wildlife. To watch these animals struggle against nature alone can be devastating.

This issue definitely concerned me as I observed over 40 trumpeter swan and over a thousand snow geese on the very ground and water the proposed route and alternate Lincoln to Helmville route, is projecting to destroy. This valley without a doubt is a major flyway for [illegible] water fowl. [illegible] God given creatures and how much can we destroy before it's too late? What will be left for our fellow citizens and generations to follow?

As I drive to Missoula, along the Clark Fork River and look out I see an area already polluted with power lines, etc. Why should we the people allow this to be spread all over our beautiful state? I believe if it has to be [illegible] keep it centrally located and don't destroy [illegible] of our [illegible] all of this for a 100 mile distance more or [illegible] At the same time we allow our [illegible] to die. [illegible] couldn't they [illegible] the railroad or the railroad right of way?

Do we the people have any say any more? Do we live in a free country? [illegible] is beginning to [illegible]

Sincerely,

[illegible]

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**L-36**

April 11 1979

Bureau of Land Management

Dear Sirs - This letter may arrive a bit after your official deadline for public comment, but please take it into account anyway. And consider that it represents the desires of most of my neighbors on Lopez Island.

Do not put in a cross-sound pipeline from Port Angeles to Camano Island. The time when we can be careless with our natural surroundings is over. If we want to continue existing as an animal species ourselves, we must realize that we are a part of a living system - The fact that we have cushioned ourselves from the natural environment to the point where we think we can live in our minds and let financial gain be our highest priority has brought us to a planetary scale crisis - Which many people unfortunately are not yet conscious of.

Life is too sacred to be dealt with in percentage factors relating to risk probabilities - these terms belong only in the business world - WHICH MUST BE SUBORDINATE TO OUR CONCERN FOR NATURAL LIFE. We need desperately a change, a TREMENDOUS change in our consciousness, when weighing economic concerns with protection of a healthy natural environment. Please let this letter serve as a catalyst to help us all in the humbling change we must go through in valuing life - LIFE on Earth - our highest concern

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**L-37**

HOLMES HARBOR CONSERVATION CLUB

P. O. Box 463
Freeland, Washington 98249

April 13, 1979

The Bureau of Land Management
1250 Lloyd Building
700 N. E. Multanomah Avenue
Portland, Oregon

Dear Sirs:

Re: Northern Tier Pipeline Co.

I oppose the Admiralty Inlet, Island County, Saratoga Passage route of the pipeline.

I attended the meeting held by Northern Tier in Coupeville, Whidbey Island on April 12, 1979 and came to the following conclusions:

All of the potable water used on Island County is obtained from ground waters, except for the city of Oak Harbor and the Navy base. There has been no accurate study made of this ground water supply. Because of increasing demands on our water, we are already apprehensive about the water supply.

The Northern Tier Pipeline Company's geological studies of the pipeline route across Island County are based on Water Bulletin No. 25, a study done in 1965, and a 1978 study by The Department of Ecology. The 1965 study was not comprehensive and the 1978 study was a very limited study of a few small

The above incomplete studies do not provide sufficient information to guaranty that our water supplies will not be contaminated by an oil spill. This risk of contamination is too great to permit the pipeline to cross Whidbey and Camano Islands.

The problems created by an oil spill on or under the waters of Admiralty Inlet or Strait of Juan De Fuca would be very serious.

Discussion at the meeting was limited to what happens if the underwater pipeline leaks. This would definitely effect the very healthy and extensive marine environment in this area.

No mention was made about the disaster that would happen if one of the 300,000 d. w. ton tankers supplying the pipeline should have an accident. The loss of marine life and damage to private property would be very extensive.

Because these 300,000 ton tankers stop at Pt. Angeles, doesn't mean that they might not be involved in an accident. There is a long history of marine accidents occurring in the area between Cape Flattery and Port Angeles.

I feel that even the effect of turbidity caused by burying the pipeline under water would have an adverse effect on marine life.

The shorelines and bluffs of our islands are fragile and disturbing these areas with the pipeline will cause even greater erosion to take place and at a more rapid rate.

I understand that the reason for this route is to tie in refineries in Anacortes and Cherry Point. Recent news items state that these refineries do not want this service. In fact, at this time, Northern Tier does not have a contract with these refineries.

The dangers to the marine environment consisting of Strait of Juan De Fuca and the waters of the San Juan Islands, Admiralty Inlet, Saratoga Passage and Deception Pass plus the dangers to a fragile island ecological system is too great a risk to permit this pipeline route to be approved.

Yours truly,

William H. W. Semple
William H. W. Semple,
President

Copies to:
Mr. Lou Romeo, Island County Commissioner
Seattle District, Corps of Army Engineers

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**L-39**

ISLAND COUNTY
STATE OF WASHINGTON
RESOLUTION #______

A RESOLUTION PERTAINING TO THE PROPOSAL OF THE NORTHERN TIER PIPELINE COMPANY TO CONSTRUCT AN OIL PIPELINE ACROSS WHIDBEY AND CAMANO ISLANDS, ISLAND COUNTY, STATE OF WASHINGTON

WHEREAS The Northern Tier Pipeline Company proposes to construct an oil pipeline for the transhipment of oil to the Midwest United States, and

WHEREAS Said pipeline would involve underwater lines, land and water interfaces on the fragile shores of Whidbey and Camano Islands, and the burying of the pipeline through fields, forests, residential areas and Island County roads; and

WHEREAS The potential damage to the environment appears to outweigh the benefits to the public of Island County; and

WHEREAS The pipeline as a public utility is not necessary to maintain the community health, safety and well-being nor does it facilitate coordinated land-use planning and management:

NOW THEREFORE BE IT RESOLVED AS FOLLOWS:

The Board of Island County Commissioners hereby goes on record as opposing the construction of an oil pipeline through Island County.

APPROVED AND ADOPTED THIS 13th DAY OF FEBRUARY, 1979

BOARD OF COMMISSIONERS
ISLAND COUNTY, WASHINGTON

Delmon L. Anderson, Chairman

R.W. Christiansen, Member

Lou A. [illegible]eo, Member

ATTEST: E. Duane Kemp, County Auditor
and Clerk of the Board

L-40

The Bureau of Land Management
1250 Lloyd Building
700 Multnomah Ave.
Portland, Oregon
97232

Regarding the draft EIS on the Northern Tier Pipeline.

Liquifiable soils:

Sites of potentially liquifiable soils have been confirmed by Northern Tier's geologist. One of these sites is in the Saratoga Passage. Saratoga Passage is a slow flushing body of water.

It is my understanding that liquifiable soils are not compatable with pipelines. The condition is likened to a bowl full of jelly and the earthquake vibrations continue in the soil much longer than stable soils. The vibrations could continue long enough to separate the lengths of pipe and cause a major spill of the contents of the pipeline.

The area Northern Tier wishes to cross is in the Circum Pacific Mobile Belt. This is the same belt that Alaska and California are in. Major earthquakes have been experienced in both states, as well as Seattle.

Saratoga Passage is inter-related with the Skagit River. The run-off from the mountains in the sping carry mud, rocks, debris such as branches, tree stumps, etc. This run-off throught the years has created a body of land called the Skagit mud flats. These flats extend for acres, and portray a force of nature to be reckoned with, for these is constant movement in these soils.

The unique conditions and characteristics of Saratoga Passage deserve a full study by a neutral agency, such as U.S.G.S. The environment of the area is of great value and should not be tampered with unless responsible, accurate study of the area is done by a neutral agency.

Harriette Hayes

Harriette Hayes , Island Action Coalition
1416 E. Rose Lane
Oak Harbor, Wa.
98277

Enclosure:
Newspaper article on
earthquake activity in
Puget Sound area.

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L-42

STATE OF WASHINGTON
Dixy Lee Ray
Governor

OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION
111 West Twenty-First Avenue, Olympia, Washington 98504 206/753-4011

April 5, 1979

Bureau of Land Management
Oregon State Office
729 N.E. Oregon Street
Portland, Oregon 97208

Dear Sir:

A staff review has been completed of the Draft Environmental Impact Statement for the proposed Crude Oil Transportation System. The Draft exhibits a thorough and well-reasoned consideration of the cultural environment in spite of the comparatively short time alloted for data gathering and preparation. Our review has resulted in the following comments and suggestions which we would like to submit for consideration for inclusion in the Final Statement.

Section 3.2.10 (p. 3-95) dealing with impacts to cultural resources should be expanded to address the potential for impact at materials source sites, access roads, and staging areas. The potential for data loss due to amateur collection by construction crews and others could bear more emphasis.

Section 4.10 (p. 4-5), "Measures required by state and local agencies," should be revised to include Washington's Indian Graves and Records" law of 1941 (RCW 27.44.010), a copy of which is attached. References to portions of 36 CFR Part 800 should be revised to correspond with the revised regulations as published in the Federal Register, Vol. 44 No. 21, January 30, 1979.

Discussions of the cross-Sound route should include consideration of submerged prehistoric and historic cultural resources. Dr. William Smith of Central Washington University currently is developing a statewide underwater archaeology program under grant from this office. We suggest you contact him for further information.

Provisions for ensuring professional accessibility of the data generated by surveys, testing, and data recovery programs are most important. The Statement should address the necessity for publication of these data in a responsible format.

We also would like to see some discussion of steps to be taken should Northern Tier Pipeline Company not conform to acceptable standards of resource identification and impact mitigation. Since the Bureau of Land Management's responsibility for compliance with Section 106 of the National Historic Preservation Act of 1966 cannot be delegated, it would appear in the agency's best interests to address this contingency.

We appreciate this opportunity to comment and hope that our suggestions may be of some use. Thank you for your consideration of our cultural heritage.

Sincerely,

JEANNE M. WELCH, Deputy State
Historic Preservation Officer

Sheila Stump, Archaeologist

mw
Enclosure

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L-43

COMMENTS ON THE BUREAU OF LAND MANAGEMENT'S DRAFT
ENVIRONMENTAL IMPACT STATEMENT

CRUDE OIL TRANSPORTATION SYSTEM

from the

COALITON AGAINST OIL POLLUTION

delivered to

Bureau of Land Management
729 N.E. Oregon Street
Portland, Oregon 97208

The Coalition Against Oil Pollution has completed its review of the Bureau of Land Management's Draft EIS for Northern Tier Pipeline Company's Crude Oil Transportation System. The Coalition is appreciative of the enormous amount of time and analysis involved in the production of this voluminous document. However, the Coalition would like to submit comments at this time pointing out deficiencies in several major areas of the DEIS which we feel will require significant additional information and supporting analysis in order to meet the comprehensive requirements of the National Environmental Policy Act.

GENERAL COMMENTS

The following general comments refer to shortcomings in the BLM's efforts to fully comply with NEPA in their environmental impact analysis of the Northern Tier proposal.

I.

According to Section 102(c) of NEPA, an EIS should be a detailed statement providing enough information to enable the President and the Council on Environmental Quality to make responsible decisions that fully consider all the complex costs and benefits of the proposal. The enormity of the Northern Tier proposal requires far more detail than appears in the EIS.

(a) Areas designated to be of "no significant impact" such as the probability of landslides in the Puget Sound region reflect as absence of essential baseline data and analysis. Landslides occur frequently in the Puget Sound Basin. Evidently "no significant impact" can be interpreted as insufficient information. The BLM's incomplete analysis of potential hazards makes it impossible for the reviewer to distinguish whether a potential problem is really of no consequence or whether the BLM simply has not fully investigated it.

(b) The BLM relied far too heavily on data supplied in NTPC's application, transcribing it directly into the DEIS. In 1977 the EPA checked the bubbler monitoring sulfur dioxide levels in Port Angeles and found it to be seriously miscalibrated, invalidating all the sulfur dioxide readings taken from that site. NTPC went ahead and published the discredited $SO_2$ figures in their application which BLM republished in their DEIS. The BLM has miscarried its responsibility as a lead agency by failing to gather valid air quality information from the EPA. The Council of Environmental Quality guidelines instruct lead agencies to "insure the maximum participation of all concerned agencies, a sharing of expertise and a consideration of cumulative impacts." Clearly, the BLM has violated the intent of NEPA and the CEQ.

(c) On March 23, within two weeks of the closing of the comment period on the DEIS, NTPC radically changed their proposed pipeline route in Washington State. The route change involves approximately 140 miles in Island and Snohomish Counties unmentioned in the around-the-Sound route.

Ignoring the obvious fact that the fourteen page discussion of the cross-Sound alternative in the DEIS does not provide enough baseline data to analyze a 140-mile route change, the BLM contends the old DEIS is adequate. Crucial considerations such as possible fault lines in Puget Sound close to Whidbey Island are not mentioned in the DEIS. If the court's standards ensuring nothing less than comprehensive and objective analysis of a proposal by the lead agency (Environmental Defense Fund v. Corps of Engineers, 348 F.Supp. 927, 2 ELR 20349) are applied to the discussion of the cross-Sound alternative, the BLM is clearly acting irresponsibly.

Supplemental information and an extension of the DEIS review period will be necessary to comply with NEPA as well as the Public Utilities and Regulatory Act. The DEIS overlooks the Act's provision which could require the government to consider hook-up of the pipeline to Puget Sound refineries (Section 507.2A of the Act).

II.

Besides overlooking the constraints promulgated by NEPA and the Utilities Regulatory Act, the BLM has neglected to fully investigate the legal implications of the NTPC proposal.

(a) The Washington Coastal Zone Management program is barely mentioned in the DEIS. The physical and legal restrictions the Act and shorelines program would place on the pipeline are not delineated in the DEIS.

(b) The one-mile pipeline corridor would cross the Pacific Crest National Scenic Trail in the Cascade Mountains. Protected under the National Trails System Act, the Pacific Crest trail is of national scenic importance and siting the pipeline route across it will undoubtedly decrease its value to recreationalists. Utility corridors through removed, forested areas inadvertently encourage use by dirt bikers and snowmobilers. The BLM has not carefully weighed the ramifications of this violation of the intent of Federal law.

(3) According to the BLM's DEIS, sulfur dioxide levels will exceed the maximum levels tolerable in Olympia National Park, perhaps as often as four times a year. Non-attainment of the Class AA standards set by the Clean Air Act, 42 USC §7401, conflicts with federal law and could threaten the location of NTPC's transfer terminal in Port Angeles. The BLM has failed to comment on this crucial issue.

CONT.

(d) House Bill 268, which is currently in Rules II of the Washington State Legislature would prohibit construction of a crude oil pipeline across Puget Sound. Passage of this bill would threaten Northern Tier's recently announced proposal and could possibly conflict with the federal Public Utilities and Regulatory Act. The BLM has not even noted the existence of this bill in the DEIS, though its passage could generate long court battles.

SUBSTANTIVE COMMENTS

The following comments draw attention to specific deficiencies in the DEIS which especially warrant further investigation by the BLM. The Coalition hopes these comments will aid in making the final impact statement a comprehensive analysis of Northern Tier's major proposal and alternatives that fully comply with NEPA.

I. Port Angeles

(a) Socio-Economic Impacts.

In general, a much better assessment of the direct and secondary effects of siting the tanker terminal on Ediz Hook is needed. Construction by NTPC will cause an influx of NT employees and their families. The BLM estimates that between 1980-81, construction will cause the population of Port Angeles to fluctuate by an additional 100 to 1,100 people. The BLM does not consider that employment opportunities in Port Angeles will attract more people searching for a job than can possibly be hired. Nor can Northern Tier employees and the unemployed attracted to Port Angeles be assumed to be transient populations. The beauty and peacefulness of the Olympia Peninsula could entice many families to settle there, further aggravating the unemployment situation. Port Angeles is poorly equipped to deal with both the influx of NTPC employees and the unemployed resulting from construction and operation of Northern Tier's system. Available housing and public services are already in short supply. The impact of waves of construction workers and tanker crews upon the "small town ambience" of Port Angeles has not been considered.

NTPC has offered to mitigate these impacts on Port Angeles merely by constructing temporary housing and offering to assist the city to obtain an Energy Impact Grant. NTPC's construction is scheduled to begin in 1979, long before the necessary grants and studies could be obtained according to the BLM's assessment. Despite the inadequacy of these mitigation proposals, the BLM insists on expediting the review process for the proposal so that NTPC can begin construction on schedule.

(b) BPA Power Shortage.

Even if the Northern Tier transfer terminal is not built, Port Angeles City Light will be about 13 megawatts short of the electricity needed to supply the City in 1983. After construction of the terminal, Clallam County will be incapable of covering the City's shortage. The Clallam County PUD will have sufficient power in 1983 only if NTPC's 11.1 megawatt load is not added to it.

Construction of the NTPC facility is the watershed line determining whether Port Angeles and Clallam County can supply their own electricity needs in the 80's. If the local PUD supplies the tanker berth facility, difficult choices will have to be made during a cold snap or peak electricity demand periods. The utility district could face as much as a 1.7 megawatt deficit. Power would be shut off to local industries including NTPC. Workers would be laid off, business would suffer, and tankers loaded with oil would stack up outside the harbor waiting to enter. Neither the BLM nor NTPC has addressed the socio-economic or environmental hardships the projected power shortage could pose, nor have mitigating measures been suggested.

(c) Tankers.

Science Applications, Inc. (SAI) estimated the number and frequency of tanker visits to Port Angeles required by the pipeline system for the BLM's DEIS. Their data served as a base to quantify the risk of oil spills in the harbor and the hazards resulting from tanker emissions containing sulfur dioxide and hydrocarbons.

SAI's figures only project the number of tanker visits per year for the initial pipeline system capacity of 709,000 bbl/day. No estimates for ultimate throughput of 933,000 bbl/day are provided. To project the frequency and severity of oil spills and tanker emissions at ultimate system capacity, SAI simply blew up their tanker visit estimates for initial system capacity proportionally.

The situation is simply too complex to consider these extrapolated figures valid. The Jones Act specifies that only American tankers can transfer oil between American ports in interstate commerce. Unfortunately, the shortage of large American tankers means that NTPC will have to hire more and more smaller tankers to supply enough oil to Port Angeles to reach ultimate system capacity. Smaller tankers invariably are old and poorly equipped. Smaller tankers cause more spills and more severe spills than large ones according to the Coast Guard. The BLM's DEIS underestimates risk analysis of spills in Port Angeles.

The BLM must reevaluate the possible risks of oil spills to Port Angeles harbor and its environs. Oil spilled from a small tanker outside Port Angeles harbor could travel west with the ebbing current[1] and devastate fingerling salmon at the mouth of the Elwha river. The Elwha tribe has only recently been able to reestablish harvestable salmon in that river.

II. Submarine Pipeline

(a) The BLM analyzes only a fraction of the submarine pipeline route favored by NTPC. The DEIS supplies more information on the 6.5 miles of submarine pipeline between Ediz Hook and Green Point than on the seventeen-mile span proposed between the Olympia Peninsula and Stanwood.

The intent of environmental impact statements as set forth in NEPA is to provide the government with sufficient data on a proposal to enable responsible decision making. The cross-Sound pipeline route favored by Northern Tier crosses possible fault lines originating in Haro and Rosario Straits. This seismic hazard is not even acknowledged in the BLM's DEIS. Until the BLM supplies additional baseline data to supplement the DEIS, it is imperative that the environmental impact process be halted temporarily.

(b) Laying the submarine pipeline span between Ediz Hook and Port Angeles will significantly degrade Port Angeles waters according to the BLM. The rise in turbidity, sulfides and dissolved oxygen levels could warrant a change in EPA water quality classification from Class A to Class C. Commercial fishing in the harbor and nearby fishing areas could be curtailed for years. The DEIS does not scrutinize the ramifications of construction or operation of the submarine pipeline on the local fishing industry.

CONT.

Chronic small oil spills and major spills will undoubtedly stunt the fishing industry in the Port Angeles area as well. If NTPC chooses to lay the submarine pipeline on the bottom of Port Angeles harbor and across the bottom of Puget Sound instead of burying it in a trench, the pipeline will be vulnerable to ruptures from anchor dragging. The BLM must carefully weigh the relative costs and benefits of trenching the pipeline or laying it on the bottom of Port Angeles harbor and Puget Sound.

Discussion of clean-up techniques for oil escaping from a ruptured submarine pipeline is virtually non-existent in the DEIS. Northern Tier's recent change in route compels the BLM to thoroughly discuss the potential problems involved to protect Washington's enormous aesthetic and economic interests in Puget Sound waters. No estimates of the expected number of oil spills over twenty years for the submarine pipeline across Puget Sound are included. Without supplemental information, we can only assume that Northern Tier will rely on the Clean Sound Cooperative to handle any marine spill, including one from a ruptured submarine pipeline.

According to Barry Paulsen of Crowley Environmental Services, their major contractor, the Cooperative is only equipped to handle surface spills. Unless Northern Tier intends to provide additional equipment and technical expertise, a submarine pipeline spill could threaten Puget Sound.

Both Northern Tier and the BLM must address the hazards and potential clean up problems of a submarine pipeline spill. Is there equipment to contain and clean up oil from submarine pipeline ruptures before it rises to the surface? Would heavy Alaskan crude even rise to the surface since its pour temperature is roughly twenty degrees higher than the median temperature of Puget Sound waters? If the oil does not rise to the surface but congeals into sheets or balls underneath Puget Sound, how will it impact the marine life? The DEIS is clearly inadequate until questions like these are answered responsibly.

III. Pipeline System

(a) Leak Detection System (3-65 & 66)

Northern Tier claims the SCADA leak detection system can pick up pressure changes of 0.5% in the oil moving through the pipe. Though a state-of-the-art system, SCADA's level of sensitivity is a major concern. Assuming 100% reliability of the currently untested system, up to 4,665 bpd could spill at ultimate system capacity, undetected by SCADA. A "minor" leak of 4,665 bpd could have disastrous environmental consequences.

Northern Tier proposes to rely solely on aerial reconnaissance of the pipeline route once every two weeks. 65,310 barrels of oil spilled within a two-week period could irreparably damage land and water resources within the vicinity of the rupture. The DEIS should consider the possibility that the pilot may not observe the spill. The route may not always be clearly visible or be unobstructed by snowfall or vegetation from the air. Oil could accumulate from a small leak along Snoqualmie Pass for several months, remaining buried under several feet of snow until the spring thaw.

The BLM's DEIS does not address the critical need for observation of the pipeline and a back-up detection system to the SCADA plan. The applicant is presently developing a complete spill contingency plan which will not be ready for review by the appropriate government agencies until construction of the pipeline system is nearly completed. Little is said in the DEIS about what the plan will provide. Complex questions concerning the extent of NTPC's ability to assume the costs of clean up of a major land or marine spill and what commercial insurance or other formal financial alternatives are available to local governments must be explored. The specific responsibilities of the applicant, the state, and local governments to clean up and pay for a spill need to be delineated long before the system is constructed to protect the resources of the Northern Tier states.

Though the DEIS attempts to outline clean up methods for marine oil spills, terrestrial spills are untouched. Analysis of the frequencies and causes of past pipeline spills on land are not even included. Buried only three feet below the ground surface, the pipeline could easily be ruptured by the heavy equipment of a careless road construction crew. Route markers above ground will be placed every half mile or so. A buried pipeline owend by Trans Mountain was ruptured in 1973 spilling approximately 10,500 bbl of oil in similar circumstances.

(b) Geologic Hazards

The BLM's analysis of geologic hazards along the route is based on soils and seismic data lifted straight out of NTPC's application. NTPC's baseline data is largely unreferenced and is only a sketchy approximation of actual conditions recorded by the Soil Conservation Service. Without proper soils maps, geologic hazards such as landslides and liquefaction cannot be evaluated responsibly. Landslides occur frequently in the Puget Sound basin, posing a significant threat to safe operation of the pipeline. While they are aggravated by normal rainfall levels between November and April in Western Washington, landslides are usually induced by human activities.[2] Loss of soil shear strength from trenching and construction of the pipeline during the summer could result in landslides when the soil is saturated by winter rainstorms. Even a small slide underneath the pipeline could stress the pipe enough to cause a rupture.

According to NTPC only slopes of fifty percent or more are sufficiently dangerous to require engineering measures to guard against slides. Yet the partially consolidated and unconsolidated soils indigenous to the Puget Sound basin pose significant slide hazards on slopes no greater than fifteen percent. The network of small, largely unmapped faults peculiar to the area magnify the soil stability problems of the Puget Sound basin.

Comprehensive baseline data, identifying areas prone to landslides and liquefaction, must be identified by the BLM before the applicant settles on the exact placement of the pipeline within the one-mile corridor. NTPC must avoid potentially

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[1] DIW Report III-90 Federal Water Pollution

[2] Tubbs, Donald. Landslides in Seattle, pp. 1-10. DNR Division of Geology & Earth Sciences Information Circular No. 52.

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hazardous areas or suggest appropriate measures to reduce the threat of disaster from a pipeline rupture. Specific measures to prevent slope failure and reduce pipeline stress by allowing for slack along hazardous spans should be explored in depth.

(c) River Crossings (pages 1-44, 4-2, and 5-16)
Salmon and trout fishing is a staple industry in the Puget Sound basin that is seriously jeopardized by logging, construction and development. Siltation of rivers and streams from dredging and road building threatens to destroy this resource. Sediment particles suffocate fish eggs by sticking to their outer membranes and reduce the viability of emerging fry.

The applicant's pipeline will cross myriad rivers and streams in the Puget Sound basin. The DEIS only catalogs the fish indigenous to the larger rivers, without mentioning those found in smaller rivers and streams. NTPC intends to lay the pipeline across the river bottoms by trenching, dredging, or blasting. Ignoring the risk of fluvial oil spills, the impacts of pipeline construction could damage this resource for at least twenty years. Other river crossing methods must be sought by NTPC and the BLM.

(d) Ground Water
Only a general discussion of potential ground water contamination from an oil spill is included in the DEIS. All the acquifers supplying water to the population of Western Washington must be identified and avoided by the applicant. Extensive analysis of the area's hydrological resources is essential before the pipeline route is set.

The pipeline route around the Sound would have cut across the city of Shelton's acquifer near Hoodsport. Other acquifers will possibly be threatened in Snohomish and Island Counties by the recent route change. The DEIS does not provide enough detailed, accurate soils and depth to water table data to enable planners to determine this. Due to the absence of any discussion of potential contamination of acquifers by a pipeline leak or possible clean up techniques such as pumping the acquifer, the BLM's DEIS is plainly unacceptable.

(e) Socio-economic Impacts.
The livability of a community along the pipeline route could be devastated by a terrestrial spill. Ground water could be contaminated, prime agricultural lands could be destroyed, and local streams could be fouled indefinitely. The DEIS does not evaluate the impacts of a terrestrial spill on towns and communities located in the pipeline corridor, especially those in areas prone to geologic and soil instability.

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**L-44**

STATE OF WASHINGTON
Dixy Lee Ray
Governor

OFFICE OF FINANCIAL MANAGEMENT
[illegible]
Orin C. Smith, Director

April 12, 1979

Mr. Murl Storms
Oregon State Director
Bureau of Land Management
Northern Tier Project
P.O. Box 2965
729 N.E. Oregon Street
Portland, Oregon 97232

Dear Mr. Storms:

Review of the Bureau of Land Management's Draft Environmental Impact Statement on the Crude Oil Transportation System proposed by the Northern Tier Pipeline Company has been completed by agencies of the State of Washington. The state review was coordinated by the Office of Financial Management on behalf of the Governor as the designated state clearinghouse.

Comments were received from the Washington State Energy Office, Washington State Parks and Recreation Commission, Department of Ecology, Department of Transportation, Department of Natural Resources, Department of Game, and the Department of Fisheries. These agencies have made substantive comments on the proposed Northern Tier Pipeline System and it is understood that the Bureau of Land Management will respond directly to the enclosed comments and recommendations provided by the state agencies.

While the agency comments provide specific, detailed comments on those portions of the statement which relate to their area of jurisdiction and expertise, several issues of statewide significance are identified. These issues are highlighted below for your consideration in the further development of the impacts associated with the proposed transportation (pipeline) system:

1. The overall national need for the proposed Northern Tier Pipeline System should be addressed more thoroughly. As the State Energy Office notes, "the most important point to be considered is that there must be a clear-cut determination and statement of national need for the Northern Tier Pipeline Company pipeline — or any other interstate pipeline -- originating in Washington State to enable gaining the necessary approvals to build the system. Such a determination and statement were not evident in this draft EIS." The Department of Ecology also comments that the question of need for a project of this magnitude has not been adequately addressed in view of the economic and environmental impacts on this state.

2. The recently completed Draft Report on "Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000," released by the U.S. Department of Energy considers crude oil transportation systems and crude oil demand of the refineries in the Northern Tier states. The preliminary findings of this report address both the need for additional petroleum transportation systems and a number of specific alternatives, including the Northern Tier Pipeline Company's proposed pipeline project, proposed to meet these needs. The results of the Department of Energy's needs analysis and any other pertinent information should be incorporated into further considerations of the proposal.

**CONT**

3. The reviewing agencies indicate that the draft environmental impact statement does not provide sufficient information or data for the state to adequately assess the impacts of the proposed action. This lack of information prohibits the state and its agencies from completing a meaningful review of the proposed action so that informed decisions can be made with full knowledge of the project's impact on the state's resources.

4. Several agencies cite the lack of discussion of mitigating measures, contingency plans, or possible trade-offs involving increased energy requirements during periods of electrical shortages in the state, clean air standards, soil erosion, damage to fish and wildlife resources, oil spill clean-up measures and transportation and highway-related costs and improvements. It is important that mitigating measures be identified and considered at this stage of the planning process, in view of the broad range of impacts associated with this project and its potential for creating additional burdens upon the state's finances and resources.

5. Since the issuance of the draft environmental impact statement, the Northern Tier Pipeline Company has submitted supplemental materials to its application to the Washington State Energy Facility Site Evaluation Council (EFSEC) for site certification to construct and operate a marine unloading facility, an onshore storage facility and the crude oil pipeline across the state. These materials indicate that Northern Tier will amend their application to EFSEC and seek state certification of the Cross Puget Sound route segment.

   The Cross Puget Sound route is presented in the draft environmental impact statement as an alternative to the proposed action. The Cross Puget Sound segment would avoid the proposed route along Hood Canal and around the south end of Puget Sound to North Bend, Washington, by crossing the Strait of Juan de Fuca from Pt. Williams, Whidbey Island, Saratoga Passage and Camano Island from where it would proceed to the mainland near Stanwood. The "Executive Summary" notes that this alternative would require the construction of approximately 20 miles of submarine pipeline across the Strait of Juan de Fuca and Saratoga Passage.

   While the proposed Cross Sound route change is covered under the alternatives section of the statement, state agencies note that insufficient detail is provided in the presentation of alternative proposals to conduct a thorough evaluation of their impact. Northern Tier's decision to utilize the Cross Sound segment represents a significant revision in the proposed action, and as the Department of Fisheries' notes for the Cross Sound alternative, "... the route, the techniques involved, the risks entailed and the resources at stake should be considered in the same detail as ... the primary route dealt with by the EIS." With its potential for impacting the marine environment of Puget Sound, the Cross Sound route and its impacts must be presented and studied in detail as part of the environmental review process.

Based upon the statewide concerns and issues identified above and the detailed comments provided by state agencies, it is the consensus of the clearinghouse that the information contained in the draft EIS on the proposed Crude Oil Transportation System (Northern Tier Pipeline) is inadequate to facilitate determination of the full impact of the pipeline on this state. In view of the lack of information on the proposed action and the decision to substantially alter the proposed route in this state by crossing Puget Sound, it is therefore recommended that the Bureau of Land Management, at a minimum, supplement the draft environmental impact statement. This would provide the necessary information for the state to fully consider the impact of the proposed transportation system.

We hope you will find these comments useful in the further development of your proposal. In view of the interest expressed by the various reviewing agencies in this project, we would encourage the Bureau of Land Management to work closely with the appropriate state agencies in its consideration of the proposed action.

Sincerely,

T A Mahar

Thomas A. Mahar
Assistant Director

TAM:dk

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**CONT**

STATE OF WASHINGTON
Dixy Lee Ray
Governor

WASHINGTON STATE ENERGY OFFICE
[illegible]
Frederick S. Adair, Acting Director

March 26, 1979

Mr. Mike Mills
Policy Analysis Division
OFM House Office Bldg. Rm. 109
Olympia, WA 98504
AL-01

SUBJECT: Draft EIS: BLM-Crude Oil Transportation System

Dear Mr. Mills:

In reference to the above document, the chart on page 1-10 is mislabeled. The columns titled Monthly and Annual Kilowatts should read Monthly and Annual KWH respectively.

In the table in page 2-36, it would be helpful to have the forecasted loads identified as years 1981 and 1985. The table on page 2-36 does not agree with the second table on page 3-46. It appears the numbers for Clallam Co. PUD's peak load estimate for 1981 have been switched with the estimate for the firm load for 1985. This error affects the calculation for the percent increase of the impacts on supply. With the correction, the increase in average load for 1985 will be 20.9%.

The impacts of increased energy use appear to be understated on two accounts. First on page 3-46, during construction of the project the influx of construction workers will increase the population above current projected levels which could significantly impact energy consumption in the residential sector.

Secondly, Port Angeles City Light will apparently experience wide fluctuations in load depending on whether a ship is unloading oil or not. This utility will experience problems quite different than the other utilities supplying relatively constant electrical load for pumping oil from the tank farm and across the state, yet no mention is made of the impacts of this situation or how Northern Tier might regulate its load in an energy shortage situation.

The problem of increased electrical loads in Port Angeles, Clallam County, and in each of the counties supporting a pump station is of great concern to Washington State, which is extremely vulnerable to electrical shortages at this time and will continue to be so until the mid 1980's. Because the legislature has specified in the Emergency Powers Act that energy supply facilities are exempt from curtailment in times of shortage, the Northern Tier Pipeline could become a serious burden to the citizens of Washington in a water short year.

The EIS statement notes the "Northern Tier Pipeline Company's proposal would increase firm energy requirements on the BPA system by about 5 percent," and acknowledges on page 5-9:

> "The electrical power requirements of the project might aggravate a potential regional power supply shortage.
>
> Local public utilities have, to date, refused to commit firm power to Northern Tier Pipeline Company (NTPC) because of possible short falls in their firm supply beginning in 1983. If local utilities serve NTPC they may be required to discontinue service to NTPC or other industrial customers if critical hydro conditions occur and thermal and nuclear generation is further delayed. In any event, local utilities would be further restricted in their ability to provide additional service."

Washington State Energy Office is concerned that the above statement is made with no discussion of mitigating measures or possible trade-offs that NTPC is willing to accept to relieve an energy shortage situation that may arise in Washington. We do not feel that Washington citizens should have greater burdens imposed upon them by the existence of this project.

This agency also urges BLM not to consider the descriptions of any of the alternative proposals contained in this statement as sufficient final evaluation in event one or more of them become significant candidates for implementation. SEO requests that more detailed material be developed on any alternative which becomes a serious candidate for national endorsement.

The most important point to be considered is that there must be a clear-cut determination and statement of national need for the Northern Tier Pipeline Company pipeline--or any other interstate pipeline--originating in Washington State to enable gaining the necessary approvals to build the system. Such a determination and statement were not evident in this draft EIS.

Thank you for this opportunity to comment.

Sincerely,

Frederick S. Adair

Frederick S. Adair
Acting Director

FSA/ma.m

cc Mike Hambrock
Department of Ecology

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STATE OF WASHINGTON
Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY
[illegible]

March 23, 1979

MEMO TO: Mike Mills, Office of Financial Management

FROM: Wilbur G. Hallauer, Director, Department of Ecology Wilbur Hallauer

SUBJECT: Comments on the Northern Tier Draft Environmental Impact Statement

Department of Ecology staff have conducted a brief review of the Northern Tier Draft Environmental Impact Statement. The review was limited because the DEIS does not present adequate information in these areas:

1. The DEIS ignores the question of need for a project of this magnitude. The proposal has very few benefits for Washington State, yet we will suffer the most severe environmental impacts. Such a project may be acceptable if the federal government indicates a definite need. A recent U. S. Department of Energy report strongly questions the economic feasibility of the proposal. The results of this report should be incorporated into the final EIS.

**CONT**

2. The federal Clean Air Act as amended in 1977 specifically limits an allowable increase in concentrations of sulfur dioxide over the baseline sulfur dioxide concentration for any Class I area. The DEIS states that $SO_2$ emissions in the Olympic National Park (a Class I area) will exceed the allowable increases. If the DEIS is correct, no federal permit can be granted. A detailed review is not justified if federal permits cannot be issued. As a minimum, the final EIS should consider specific mitigating measures.

3. Erosion control procedures, oil spill control plans, and contingency plans are not adequately discussed in the DEIS. Also, there is a lack of discussion concerning the impacts an oil spill would have on marine life, freshwater streams, public drinking supplies, and recreational opportunities. We were unable to give a detailed review on the limited data presented.

4. The status of alternative routes and facilities is still unclear. If a pipeline crossing Puget Sound is a viable option, it should have adequate coverage in the EIS.

Comments on the other areas of the DEIS are attached. We anticipate an opportunity to again comment when more information is available.

WGH:as
Attachment

### NORTHERN TIER DRAFT EIS
### COMMENTS BY THE DEPARTMENT OF ECOLOGY

1. Air Quality

   a. The EIS states that there will be violations of the Class I increments in the Olympic National Park on three to five days per year. The three-hour and 24-hour standards would be violated. The annual standard will not be violated. To avoid the Class I violations of PSD for $SO_2$, it may be necessary to limit the sulfur content of fuel oil used by ships, while in port, to 0.5 percent or less. The EIS should specifically address this issue.

   b. Should this project reach the stage where it becomes a probable new source, the modeling efforts that went into the EIS should be explained in detail.

2. Oil Spills

   a. Since oil spills are inevitable, a plan to minimize environmental damages must be prepared. A contingency plan for the pipeline as well as the unloading facility and Green Point should contain the following points:

      1) Methods for preventing vandalism and sabotage.

      2) Location and storage of clean up material.

      3) Disposal sites for recovered material and associated impacts.

      4) Plans and procedures for emergency shutdown.

      5) Methods for cleaning up oil spills and fuel spills during construction.

   b. There is disagreement within the scientific community regarding the methodology for determining oil spill movements. Our experience indicates that the approach used in the EIS may not be the most appropriate given actual conditions. We would be happy to discuss this subject in greater detail with appropriate BLM staff in developing the final EIS.

   c. The EIS states that spills will occur, yet little discussion is directed at spill prevention or reducing the quantity of oil spilled. Remote control shutoff valves or one-way check valves should be installed at major stream crossings. These should be pressure sensitive, automatic shutoff valves. Also one-way check valves should be installed at strategic locations to prevent excessive drainage from the pipe in the event of rupture. One mile of 42" pipe will contain 9047 barrels or 380,000 gallons. The impacts of onshore discharge for tank cleaning or ballast from incoming vessels also need to be addressed.

      In addition, no mention is made of heating the crude for pumping. Many crudes solidify at near room temperature and facilities for heating are a must if those kinds of oils are being pumped.

3. Stream Crossings and Water Quality Impacts

   a. On page 33, the EIS summary states that some streams may take 20 years to return to their present salmon production levels. Such a serious impact would merit a more detailed discussion of mitigating measures.

   b. The EIS states that construction will occur at low flow periods to reduce stream flow and water quality impacts. Page 1-46 indicates that major stream crossings will be constructed during a three-month period designated by "the appropriate state agency responsible for protection of fish and wildlife." Low flow periods and fish migrations occur at varying times throughout the year and are affected by varying climatic conditions. The EIS should address the effect such varying conditions could have on the construction schedule and should provide substantially more detail regarding specific major stream crossings.

   c. Page 1-57 indicates in measure #21 "that stream hydraulics and geotechnical information will be established at each stream and river crossing and the depth and burial of the pipeline at these crossings will be established to insure that the pipeline will not be subject to exposure by stream scour and meandering." This suggests that extensive data collection and engineering studies will be required. The EIS should specify the degree to which such studies have been completed and address how the time required to complete such studies is considered in the overall project schedule. Information developed in such investigations should be available well in advance of the permit decision to enable the development of permit conditions to minimize adverse impacts.

   d. Block valves are necessary at more than four major river crossings. All rivers crossing along the route plus creeks that supply large private water systems or hatcheries should have back flow/check valves. An example would be at Finch Creek in Mason County, where there is both a state hatchery and the Town of Hoodsport water supply.

   e. Routing of the proposed pipeline along the west side of Hood Canal and to the south and east of Puget Sound requires passage across seven rivers that are designated as State Flood Control Zones. These rivers are the Elwha, Dungeness, Skokomish, Black (Chehalis Basin), Deschutes, Nisqually, and Puyallup. Precautionary construction measures should be specifically addressed in these flood control zones.

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CONT

f. We are concerned over the use of rust inhibitors and bactericide in the hydrostatic test of the pipeline where large water volumes are involved. When and where will these chemicals be discharged once testing is complete? What are the environmental ramifications?

g. "Water supplies could also be impacted for individuals who are using water from springs and streams without benefit of a recorded water right. Some of these water supplies will be identified only after construction starts and problems arise.

4. Program Consistency Issues

a. Shoreline Management Act

Little mention is made of the shoreline management program and its implications for providing mitigation via the state's Energy Facility Site Evaluation Council (EFSEC). The relationship between EFSEC and the Shoreline Management Act (SMA) is significant and should be addressed in the EIS. Although EFSEC preempts the SMA and local shoreline master programs, it must take into account any law or regulation it preempts in any siting decision (RCW 80.50.100). The EIS should identify and analyze specific mitigating measures that could be considered by EFSEC as conditions to the EFSEC certification. This is especially significant in those areas where the EIS has identified inconsistencies with the local shoreline master programs. The EIS fails to identify how inconsistencies could be reconciled. For example, a local shoreline master program may designate a particular stream crossing area as "conservancy." Such designation would, under the local shoreline master program, preclude the crossing at that point. EFSEC could preempt the local master program but must attach conditions to the permit which recognize the purpose of the program so preempted. It would be helpful for the EIS to address this issue and suggest ways in which such inconsistencies could be reconciled.

b. Coastal Zone Management Considerations

The concerns noted above are also applicable to the Washington Coastal Zone Management Program (WCZMP) because shoreline management is an integral component of the WCZMP. Section 307 of the Coastal Zone Management Act (CZM) precludes federal agencies from issuing permits for projects in the coastal zone if the project is inconsistent with the state's federally approved program. A consistency determination certification must be provided to the Department of Ecology by the applicant for the federal permit. The federal consistency issue including a description of the attached procedures should be thoroughly addressed in the EIS. Also, please note the reference to the "Washington Coastal Zone Act" on page 1-57, #16, the word "Act" should be changed to "Program."

c. DOE Permits

Any major permits that would normally be issued by the Department of Ecology will be handled through EFSEC. However, minor permits required during the construction period (i.e., burning, testing, constructing staging areas) should be handled through DOE regional offices as the project develops. This should be addressed in the EIS.

5. Erosion Control

a. Descriptions of erosion control plans along the route were minimal at best. Special attention should be given to the unstable areas identified in the EIS. Who will monitor construction activities?

b. Runoff from the tank farm pumping facility and compound should be collected and passed through oil/water separators.

c. Impacts on Dungeness Spit - A significant potential effect of the onshore storage facilities is identified on page 6-2 of the EIS. Dungeness Spit is unique to the State of Washington and is considered to be one of the outstanding natural shoreline land forms in the nation. Any disruption of the natural hydrologic and geologic processes which would lead to any alteration of this significant land form and its habitat would not be acceptable. The EIS must give substantially more attention to this critical issue and should thoroughly address specific potential impacts on Dungeness Spit and mitigating measures.

6. Staging Site Impacts

a. Where will the equipment and materials (i.e., pipe storage) staging areas be located? Impacts from each staging site location should be addressed.

b. Where will the sources of pipeline bedding material, road rock/ ballast/riprap be? What quantities of each will be required? Will new pits and quarries be required? What impacts will be associated with these?

c. How will construction camp, staging, and work areas sewage be handled?

d. More specific control measures to handle ORV traffic along the route is an important concern to reduce erosion.

e. Which roads and bridges need improvements (i.e., ballast/surfacing/enlarging) to handle the project? The bridges on the Hamma Hamma and Duckabush are too small to transport large machinery.

f. Will any new access roads, haul roads, or patrol roads be constructed? If so, where?

g. The EIS did not address some of the important questions regarding the construction phase. There is a lack of information about the narrow, winding Hood Canal Highway; how much equipment would use it, how equipment traffic would affect recreation traffic in the summer, whether or not the highway will be improved before construction starts, whether or not the project would interrupt traffic.

7. Hazardous Waste

a. Most of the wastes generated during the various phases of the project would not be "extremely hazardous wastes" in the current context of WAC 173-302. However, if the context of the regulation is expanded to conform to the pending Federal Resource Conservation and Recovery Act (P.L. 94-580) categories, some potential waste materials could come into the area of direct concern (e.g. waste solvents, coating and sealing materials, explosives, etc.). This issue should be addressed.

b. The greatest potential concern regarding hazardous wastes would be the potential for catastrophic spills particularly during the operational phase of the project. This has been recognized in the report but generally minimized. "Clean-up" has been discussed but not adequately addressed from the standpoint of disposal, particularly of oil-soaked debris, sand, earth, etc. What will be the ultimate disposal destination of such clean up residuals? This topic has not been addressed in the document. Such debris and the crude oil itself will probably not be classified as "extremely hazardous waste" but would most probably constitute "hazardous waste" and cannot be simply thrown into any local landfill.

CONT

c. Interactions with the state oil and hazardous waste contingency plan should be discussed and the ultimate disposal destination evaluated for all potential spills.

8. Noise

a. The statements that residents will or will not be annoyed by a particular activity's noise indicate that some criteria were used to identify annoyance levels. What are these criteria and what sources have they been drawn from? What are the anticipated noise levels?

b. The EIS states that increases in ambient noise of 15 dBA or more is a severe impact. Many other sources, including EPA, have identified an increase of 10 dBA or more as very significant. The question of significant impact could be clarified by a tabulation of the total number of residents that would experience increases of 5-10 dBA, and greater than 10 dBA under worst case noise conditions. This tabulation should include separate classifications for construction related noise and operational noise.

c. The term "usually during the day" is often used to describe the times of construction. It is not understood what hours this is meant to indicate. Since there is potential for repeated violations of state nighttime noise limitations, construction times must be identified more specifically. Otherwise, a statement that all construction will occur only during the day would help to clarify the times of construction.

d. Predictions on page 3-9 indicate significant impacts. Under worst case noise conditions, how many noise-sensitive properties will receive levels in excess of the limitations of Chapter 173-60 WAC?

e. Information presented on page 6-2 indicates that nighttime construction will result in noise levels which violate WAC 173-60-040.

f. Page 3-58 - information is needed to substantiate the conclusion in the EIS that operational noise will not be a significant impact (the distance from pumping stations to the nearest residences, predicted levels at the residences, and changes in the ambient noise levels).

g. We recommend that notification of construction be given to residents near the pipeline at least one week ahead of the construction date. Construction near schools should be scheduled to occur on weekends whenever possible.

9. Environmental Habitats

a. The potential Green Point storage area is used by large numbers of offshore birds. A lagoon is located on the boundary of the site. As this habitat is uncommon and has diverse species, it could be impacted and should be addressed in the EIS.

b. The Dungeness Spit area is a refuge for tens of thousands of sea birds. An area behind the spit is a haul-out area for many seals. Adjacent to Jamestown is one of the largest kelp beds on the Straits. This area is highly productive. Haul-out areas on Protection Island should be given more attention in the EIS, as well as the project's overall impacts on the Dungeness Spit area.

c. The Nature Conservancy has listed the rare endangered, and threatened fauna and flora found along the pipeline corridor. This information should be included in the final EIS.

d. In many cases adjacent critical habitat areas are not identified. Identifying only those which are strictly on the proposed site does not accurately identify potential impacts. The EIS should also mention possible impacts the tank farm would have on nearby residential developments.

10. Resource Commitments

The need to relocate various facilities on Ediz Hook is noted in the EIS, yet no substantive discussion is provided regarding this issue. Relocation of a marina and VOR station could involve substantial commitments of resources at the relocation sites. The EIS should provide substantially more detail regarding relocation, including at a minimum, identification of specific alternative sites and potential barriers to relocating at these sites.

11. Editorial Inadequacies

a. The EIS contains resource maps provided by the Washington Department of Natural Resources. These maps provide only a broad overview of marine resources. The EIS should provide significantly more precise and quantitative data on specific marine resources potentially impacted by the proposal.

b. Some charts and graphs which are used in the EIS do not necessarily relate to anything said in the report. Details are given about general biological processes but specific facts are not presented about potential impact areas. Again, significantly more detail is needed for quantifying potential impacts.

c. The map plates which depict scientific research areas are not complete as to the state baseline program. Baseline data have been used in the EIS but information specific to scientific research areas has not. The information is available to BLM upon request.

Department of Ecology
March 23, 1979

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CONT

STATE OF WASHINGTON
Dixy Lee Ray
Governor

DEPARTMENT OF TRANSPORTATION KF-01

February 20, 1979

RECEIVED
FEB 21 1979

Mr. Orin C. Smith, Director
Office of Financial Management
House Office Building
Olympia, Washington 98504

Attention: Mike Mills

Bureau of Land Management
Crude Oil Transportation System
Northern Tier Pipeline Company
Draft Enviornmental Impact Statement
and Map Addendum

Gentlemen:

We have reviewed the subject documents and have the following comments:

1. Page 2-127, Table 2.1.2.13-1
   a. Reference to U.S. Highway 104 and U.S. Highway 10 should be changed to read Washington Highway 104 & 10.
   b. Indicates traffic volumes of 19,300 in 1976 for SR 20 at proposed crossings of the highway at pipeline Mile Post 198 and 202. The Annual Traffic Report for 1977 prepared by the Department indicates traffic in this Area to be 13,768 for 1976.

2. Page 2-156:
   There is no discussion about mitigating traffic congestion in the Port Angeles area and if they will assist in the cost of the possible future bypass mentioned.

3. Permits for crossing State highways will be issued under RCW 80.50 by the Energy Facilities Site Evaluation Committee. Standards for these crossings will be furnished to the Committee by the Department. Permits for hauling overweight and oversized loads will be required. The proponent should also be made aware that maintenance access for the pipeline cannot be reserved from either the main roadway or ramps of fully controlled limited access facilities.

4. Page 3-108:
   There is a discussion regarding probable road damage near storage yards and pump stations but no statement about any mitigating measures. The proponent should be made aware that if repairs or improvements to a State highway become necessary as a result of the proposal, it will be incumbent upon the proponent to pay for such costs. All costs involved in the pipeline construction on State highway right of way shall be the proponents responsibility. The proponent should also be advised that emergency road restrictions during the spring thaw could preclude any hauling over State highways during this time.

5. All crossing of State highways should require boring to determine soil stability. The statement is vague in discussing this point.

6. The pipeline crossings of SR 101 and SR 8 are within areas designated for consideration under the Scenic and Recreational Act of 1967 (RCW 47.39). The document should address the impacts relative to this act and any mitigating efforts proposed.

If you have any questions concerning these comments, please call me at 753-3811.

Sincerely,

ROBERT S. NIELSEN
Assistant Secretary
Public Transportation and Planning

By: WM. P. ALBOHN
ENVIRONMENTAL PLANNER

RSN:tml
WPA/WBH

cc: J. D. Zirkle
D. P. Swanson
A. R. Morrell
R. C. Schuster
W. R. Horning
Russell Albert
Environmental Section

---

STATE OF WASHINGTON
Dixy Lee Ray
Governor

DEPARTMENT OF GAME

March 26, 1979

TO: Mike Mills
NEPA Coordinator
Policy Analysis Division
Office of Financial Management

FROM: Joe La Tourrette
Acting Department Planner

SUBJECT: Northern Tier Pipeline, BLM Draft EIS

We have reviewed the BLM draft EIS in some detail and consulted with other appropriate state and federal agencies regarding the impact of the proposed project on fish and wildlife resources. Since virtually all the streams considered by Department of Fisheries to be important for salmon also contain steelhead, sea-run cutthroat, and resident trout species, we have essentially the same concerns about stream crossings and possible stream contamination as Fisheries. Our proprietary interests and concerns split only when we at the Game Department begin discussing marine mammals and birds, resident (non-anadromous) sport fish, and terrestrial vegetation and wildlife. We have the following general and specific comments to provide. We would appreciate a copy of the consolidated state agency response letter.

General Comments

1. The material on terrestrial vegetation and wildlife is much too brief and general. There is not enough information on non-endangered wildlife species and their habitat requirements.

2. There is not enough information on smaller streams and wetlands along the pipeline route which do not fall within your "major" stream category (page 2.57). These "minor" waterways are also important for fish and wildlife.

3. There is not enough discussion on secondary or indirect impacts, particularly from major oil spills.

CONT

Specific Comments

Chapter One

Page 1-41-46: Some of the practices described here for stream crossings are unacceptable in Washington. Please check with us or Department of Fisheries for specific criteria used for approving work in streams under our Hydraulics Code (RCW 75.20.100).

Page 1-63, 1.6 Legal Constraints: Northern Tier Pipeline Company is also bound by state law.

Chapter Two

Page 2-13, paragraph 5: Seibert Creek should be discussed here also.

Page 2-22, paragraph 1: We disagree with the last sentence. Fish congregations are determined by food supply and migration patterns. Fishing areas, at lease for sport fishing, are determined more by moorage and accessibility than by concentrations of fish.

Page 2-26, 2.1.1.8 Terrestrial Vegetation and 2.1.1.9, Terrestrial Wildlife: We agree that the material presented here is vague, we disagree that it is necessarily so. A mere mention of four bald eagles sited at Green Point is not adequate here. Port Angeles harbor itself is an important area of special concern as a nesting area for migratory birds.

Page 2-41, Table 2.1.1.15-7: Sport fishing and general tourism are important to the Clallam County economy and should be considered here.

Page 2-57, paragraph 6: Under the Hydraulics Code (RCW 75.20.100) co-administered by Game and Fisheries, pipeline construction would have to coincide with fish activity and construction would not be allowed in streams containing runs of anadromous fish. We assume at this point that approval of this project by the Energy Facility Site Evaluation Council will include conditions based on our Hydraulics Code. An April through November construction period may be unacceptable from the standpoint of fish activity.

Page 2-57, Table 2.1.2.6-1: This table should not be based strictly on flows but also on the importance of a stream to fish and wildlife.

Page 2-58, Table 2.1.2.6-2: The width of stream crossing here, particularly for the Hamma Hamma and Skokomish Rivers, appears to be for the convenience of the pipeline company at the expense of the braided floodplain which is so vital for wildlife and shellfish.

Page 2-78: Biological components should be zoological components.

Page 2-79, paragraph 1: Most western Washington streams are important habitat for salmon and anadromous trout.

Page 2-83 through 2-87: These figures are very well done but they should be expanded to include the Yakima and Columbia River drainages.

Page 2-88, paragraph 8: See our comment regarding page 2-22, paragraph 1.

Page 2-89: This section is much too brief and general. It is impossible to evaluate impacts from such general descriptions.

Page 2-95, Terrestrial Wildlife: This whole section is too general. There is practically nothing describing the non-endangered wildlife of Washington. There is important big game, waterfowl, and upland game habitat all along the pipeline route as well as critical areas for non-hunted but non-endangered wildlife.

Page 2-155, 2.2.1.8, Terrestrial Vegetation and 2.2.1.9, Terrestrial Wildlife: These statements presuppose that nothing can or will be done to protect eagles even if the oil storage facility is not built. There are measures that Clallam County can take to protect these eagles and still permit some environmentally-sensitive development.

Chapter Three

Page 3-11, paragraph 3: Excavation for the launching, as depicted on page 3-38, could change the natural sediment drift and severely impact or even destroy Dungeness Spit.

Page 3-13, paragraph 3: Not enough discussion of the impact of soil erosion on the coastal bluff.

Page 3-14, paragraph 4: Not enough discussion of the impact from increased runoff on Seibert Creek.

Page 3-15, paragraph 5: Oil spills in Port Angeles Harbor could cause oiling of feathers and mortality for wintering and migrating water birds.

Page 3-25, paragraph 8: Tar balls float to the surface and attract water birds. Oil impregnated with salt is nearly impossible to clean from feathers.

Page 3-25, paragraph 10: What is the source of the 87,000 barrel figure here?

Page 3-26, paragraph 2: Eelgrass beds do not always re-establish readily. Please document your statement that beds which are destroyed should begin to re-establish by the next growing season.

Page 3-32, paragraph 1: Zooplankton do play a vital role in the marine food web.

Page 3-32, paragraph 9: The discussion of otters is understated. The secondary impact of oil-matted fur and contamination of food supply could be major population losses. Northern sea otters are not presently on a state or federal endangered species list for Washington but populations are tenuous and are being watched closely.

Page 3-32, paragraph 12: Bald eagles also feed on marine organisms and are susceptible to oil spills.

Page 3-33, Figure 3.1.7-9: Salt marshes are important for anadromous salmonids (Fishes - openwater).

Page 3-35, paragraph 1: Loss of habitat generally means a concomitant loss of animals occupying that habitat. Although some animals do attempt to relocate, adjacent habitat is usually filled to capacity and the population stabilizes, usually after the first winter.

Page 3-35, paragraph 5: There is no discussion here of possible summer use of the area by bald eagles. Disruption of nesting territory could result in abandonment of nest sites by eagles.

L-44 CONT

Page 3-68, paragraph 3 and 4: Potential impact on Dungeness Spit from construction and operation phases should be discussed here.

Page 3-60, paragraph 8: There should be discussion of the biological impact of slides and stream blockages.

Page 3-67, last paragraph: Is this 7 miles of stream crossing pipeline length only for the 19 "major" streams or does this include smaller stream crossings?

Page 3-68, Table 3.2.6-1: This table should be augmented with a discussion of the biological impact of sediment increases.

Page 3-73, Table 3.2.6-3: Impact of pipeline rupture would be high in salmon streams draining into Hood Canal.

Page 3-79, last paragraph: Siltation from stream crossing construction would undoubtedly affect intertidal areas and the waters of Hood Canal and south Puget Sound.

Page 3-84, paragraph 4: What will be the qualifications of Northern Tier's environmental inspectors? This paragraph makes it sound like having a botanist as inspector could be quite accidental. Maybe more than one inspector is needed to accompany the construction crew.

Chapter Four

Page 4-2, (4.4): Measures to prevent or mitigate soil erosion at Green Point bluff and stream crossings should be included here.

Page 4-4, paragraph 8: The first sentence contradicts previous statements about destruction of bald eagle habitat at Green Point. Mitigation for possible damage to Dungeness Spit from construction at Green Point should also be discussed.

Page 4-4, paragraph 9: The first sentence here is incorrect. Bureau of Land Management responsibilities to mitigate losses under the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e; 48 Stat. 401, as amended), should be discussed at some length here and in Section 4.6, Aquatic Resource.

Chapter Five

Page 5-2, last paragraph: Noise will disturb wildlife during construction phase. This is especially true at Green Point where bald eagles could be adversely stressed.

Page 5-5, paragraph 3: What are the unavoidable biological impacts of drainage modification on Seibert Creek?

Page 5-6, paragraph 9: This statement appears to conflict with the paragraph on otters on page 3-32.

Page 5-7, paragraph 1: Eagles may not successfully "relocate".

Chapter Seven

Page 7-2, paragraph 1: Construction at Green Point could irreversibly alter Dungeness Spit. There needs to be more discussion of this connection in the final EIS.

Page 7-4, 7.10.1: Construction of new roads could open up new areas to recreation, including hunting and fishing.

Chapter Eight

With Northern Tier's recent decision to apply for a cross-Sound pipeline route, the whole EIS should be revised to emphasize new impact areas; Admiralty Inlet, Whidbey Island, and the proposed pipeline route in Snohomish and northern King Counties.

JLT:mjf

cc: John Douglas
John Ward
Chris Drivdahl

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STATE OF WASHINGTON
*Department of*
*Natural Resources*

COMMISSIONER
BERT L. COLE
R. A. BESWICK
SUPERVISOR

February 23, 1979

RECEIVED
FEB [illegible] 1979

State Director
Bureau of Land Management
P.O. Box 2965
Portland, OR 97208

Dear Sir:

SUBJECT: Northern Tier Pipeline - Draft EIS

The DNR has reviewed the Draft EIS for the Northern Tier Pipeline proposal. In addition to the draft, we requested five sets of county maps (scale 1/2" = 1 mile) showing the proposed Northern Tier Pipeline route. These maps were sent to our respective area managers to determine the relationship of the proposed pipeline to lands managed by the DNR. In some instances, the pipeline and access roads will pass through DNR managed lands. In addition, the crossing of numerous water bodies is also of interest to DNR since this agency manages lands within beds of navigable waters, ie., rivers, lakes and marine.

DNR concerns Northern Tier should be aware of include the following:

1. Fire permits, fire tool and equipment requirements for operations on all state and private forest lands.
2. Forest Practice Applications on state and private lands.
3. Surface mining permits (off site borrow pits) on state and private lands.
4. Right of way on all public lands of the State of Washington.

CONT

5. Waiver of damages from leasees on DNR lands.
6. Extra requirements would be needed as the pipeline crosses irrigated lands.
7. Need to be advised ahead of work schedule prior to entering State land.

Obviously, as a State Land Management agency, the DNR has proprietary interest where such lands may be affected by pipeline activity. However, the DNR also has environmental concerns for those segments of pipeline that cross water ways, particularly marine waters, where we have aquaculture activities associated with marine plant life production and shellfish harvesting activities. There are potential problems from accidental breaks in a submerged pipeline crossing Puget Sound near those activities.

These are our primary comments at this time. If you have any questions, please contact Jerry Probst, Olympia, (206)753-5308.

Sincerely,

BERT L. COLE
Commissioner of Public Lands

Ralph A. Beswick
Supervisor

RAB:jpm

---

STATE OF WASHINGTON
Dixy Lee Ray
Governor
WASHINGTON STATE PARKS AND RECREATION COMMISSION

March 26, 1979

35-2650-1820
Draft EIS - Crude Oil
Transportation System
(E-1492)

Oregon State, Director
Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sir:

The staff of the Washington State Parks and Recreation Commission has reviewed the draft Environmental Impact Statement for the Northern Tier Pipeline and offers the following comments. General comments pertaining to the impacts of the pipeline on lands under State Park jurisdiction will be presented first. Comments addressing specific points in the draft EIS will follow.

Potentially, 12 State Parks may be impacted by the proposed Northern Tier Pipeline and associated facilities. These parks are:

Dungeness Spit
Sequim Bay
Dosewallips
Pleasant Harbor
Scenic Beach
Lilliwaup Tidelands
Potlatch
Millersylvania
Flaming Geyser (including 5 other sites in the Green River Gorge Conservation Area)
Nolte
Olallie (including Twin Falls Natural Area)
Lake Easton

Dosewallips, Millersylvania, the Jellum and Palmer sites in the Green River Gorge Conservation Area, Nolte, Olallie and Lake Easton are within a mile of the pipeline (within the two mile corridor). All other parks are outside this corridor, but are downstream from a point where the pipeline will cross a stream or river, or are downhill from the pipeline route.

Impacts on most of these parks will occur during all three phases of the pipeline: construction, operation and abandonment. Visual impacts will occur where the pipeline can be seen from State Parks property. Parks that would be visually impacted are Sequim, the Jellum and Palmer Sites on the Green River, Nolte, Olallie and Lake Easton. Excessive noise during the construction and abandonment phase would impact these same parks except Sequim.

In the event of a tanker spill or pipeline rupture all parks except Millersylvania could be severely impacted; part of the parks' natural amenities may be destroyed or no longer available for public use for quite some time. Sequim Bay State Park's surface water supply system may be rendered useless in the event of a pipeline rupture upstream.

Erosion during construction and abandonment phases may have significant impact on the parks using a stream, river or marine shore as part of its recreational resource.

The following comments will address the contents of the draft EIS:

Page 1-11 Tanker Unloading Facilities. A floating boom will be placed around each tanker after docking and before unloading. How much area will the floating boom cordon off? Without knowing the area involved, the degree of interference with recreational boaters and shore-based recreationists cannot be determined. This needs thorough evaluation in the final EIS.

Page 1-22 Table 1.4-8. Clallam, Jefferson, Mason, Thurston and Pierce counties have been omitted from the minor stream crossings list.

Page 2-31 Figure 2.1.1.12-1. If this figure represents current land use rather than current zoning, it should designate parts of the shoreline on the upland side of Dungeness Spit for recreational use. This is the site of Dungeness State Park. Also, several other recreational areas are not identified: Striped Peak, the viewpoint on Freshwater Bay, the city parks in Port Angeles, the Olympic National Park Visitor Center and that portion of the Park within the 10-mile radius of the tanker berths.

Page 2-37 Recreational Resources - Pacific Coast. Although road access to parts of the coast is limited, it receives significant use from late spring to early fall and winter use is increasing rapidly.

Camping is a significant recreational activity in North Puget Sound, parts of the Strait of Juan de Fuca and much of the Pacific Coast yet it is not mentioned in this section.

Page 2-46 Social and Economic Conditions. Millions of visitors come to the Olympic Peninsula each year, not "thousands" as is stated in the draft EIS.

CONT

Page 2-57 Aquatic Resources. The criteria for determining what is a "major" stream crossing should include each stream's recreation and natural resource values. Using physical criteria for determining what is "major" is inadequate and can be misleading as to the total value of each stream or river as a resource.

Page 3-17 In-Transit, At-Berth and Tank Farm Oil Spill Risk. It is stated that "the estimates (spill frequency) are valid only if conditions do not change significantly from historical patterns." Historical patterns for the physical conditions (weather, currents, tides, etc.) in the Strait of Juan de Fuca exist. However, the historical patterns for large tanker traffic in the Strait do not exist because very few tankers of the size proposed have ever entered the Strait. How can spill frequency for in-transit tankers traffic be generated if this data does not exist? If the in-transit data comes from other sites how can it be valid for the Strait of Juan de Fuca?

The data presented for spill frequency and predicted spill pathways is for an undertermined amount. What is the worst possible case?

What will be the long-term effects of small, frequent spills?

Page 3-37 Visual Resources. Hurricane Ridge and the road leading to it offer spectacular views to the north. Ediz Hook and Green Point are clearly visible from major viewpoints. The tanker berths and facilities and the tank farm will definitely intrude upon these views.

Page 3-47 Recreation Resources. It is stated that "curtailment of use of the Port Angeles-Victoria auto ferry would affect an indeterminate number of recreationists..." How and when will ferry operations be curtailed? What would be the loss to ferry users and the Washington State Department of Transportation in terms of convenience, availability of transportation, revenues, etc?

In evaluating the impacts of tanker accidents and pipeline ruptures on recreation, economic data showing the dollar value of potentially impacted recreation facilities and activities needs to be presented. Recreation is a significant part of the state's economy. Residents of Washington and both out-of-state and foreign tourists pursuing recreational activities support some of the larger industries in the state. Activities such as recreational boating, shellfish harvesting and sports fishing provide some of the largest economic benefits to the state.

Data reflecting these economic benefits must be presented. Use data for established recreational sites and facilities is also essential in assessing the impacts of the pipeline.

Page 3-48 A tanker spill off of Neah Bay may adversely affect the Olympic National Park Wilderness Beaches along the Pacific Coast.

Page 3-50 Social and Economic Conditions. The assumption that "damages from an oil spill to aesthetic and recreational values would have a minor effect on tourism" is false. Effects may be minor to severe. The effects of a massive oil spill on the motel business of the city of Santa Barbara cannot illustrate the total impacts of an oil spill of the same magnitude in the Strait of Juan de Fuca or in Port Angeles Harbor.

Page 5-10 Unavoidable Impacts. A marina and a boat launch facility in Port Angeles Harbor will be lost to recreational boaters. The disruption of the harbor and boating traffic caused by the Northern Tier port facility will impact water-related recreational activities. Construction, operation and abandonment of the pipeline and related facilities will have minor to severe impacts on recreation. Some impacts will be short-term, others long-term. Oil leaks and spills will possibly be detrimental to recreation. All the disruptions or damage to recreation activities and resources will cause an economic loss to the State of Washington and its citizens which may be long-term and of a significant magnitude.

Page 6-2 Onshore Storage Facilities. "The notch may also change erosion rates on the cliff, and thereby affect the deposition of silts and sands on Dungeness Spit east of Green Point." Anything that may change the erosion rates of the bluffs west of Dungeness Spit will alter the accretion rates of the spit. If breaching of the spit occurs more frequently due to erosion control measures at the bluffs, severe damage may occur to the spit and its resources. This is particularly true in the event of an oil spill when the spit has been breached. This must be considered as a very severe potential adverse impact upon recreation and the natural resources of the area.

Page 8-37 Low Point-Preferred Alternative. This alternative port site will have fewer impacts on recreation than the Port Angeles site. Marine facilities, harbor and ferry traffic would not be disrupted as is the case with Port Angeles port site although tanker traffic and the offshore single point mooring systems will interfere with recreational and some commercial boating traffic.

Tanker accidents on route to or docking at Low Point will have much the same impact as accidents occurring on route to or in Port Angeles Harbor including possible damage to Dungeness Spit (see comment under "Page 6-2 Onshore Storage Facilities"). Pipeline leaks and spills will affect an additional 24 rivers and streams, many which have high recreation and natural resource value. Pipeline spills at stream and river crossings will also impact the shoreline along the Strait of Juan de Fuca.

Page 8-43 Recreation Resources. In the event of a spill at Low Point many recreational activities and facilities in the Strait of Juan de Fuca, the San Juan Islands and Canada may be severely impacted. These impacts may be short or long-term. Once again, economic data showing the dollar value of potentially impacted recreational facilities and activities needs to be presented to fully evaluate the impacts.

Erosion and bottom sediment disruption during the construction and abandonment phases of the port facilities and pipeline may have significant impact on areas with high recreation and natural resource value.

Page 8-49 to 57 Cross Puget Sound Alternative. Potentially 13 parks will be impacted by this proposed alternative pipeline route. These parks are:

Dungeness Spit
Sequim Bay
Fort Worden
Old Fort Townsend
Fort Flagler (including Mystery Bay Recreation Area)
Fort Ebey
Fort Casey
Joseph Whidbey (Whidbey Island NAS)
Deception Pass
South Whidbey
Camano Island
Olallie (including Twin Falls Natural Area)
Lake Easton

Fort Ebey, Joseph Whidbey, Olallie and Lake Easton are within 1 mile of the pipeline. The pipeline passes through the proposed development at Joseph Whidbey State Park. All other parks are along shorelines that may be impacted during the construction, operation and abandonment phases depending on the currents, tides, wind and weather.

In the event of a pipeline leak or rupture all these parks may be severely impacted. (In addition to these parks, the Washington State Parks and Recreation Commission owns and operates a dozen marine parks and miscellaneous small islands in the San Juan Islands. Any of these may also be impacted by a pipeline rupture.) The visual impact would be great under these circumstances. Many recreational activities would be lost for a short or long duration. Natural amenities of each of these parks may be lost (shellfish and fish resources, etc.). Some facilities may be damaged. Bottom sediment disruption or land erosion during construction and abandonment phases may have significant impact on the shoreline or water related activities of each of these parks.

CONT

Page 8-51 Marine Resources. A leak detection system capable of sensing a 0.5 percent loss of throughput volume is highly inadequate. This means over 148,000 gallons per day during the initial throughput or over 195,000 gallons per day during the final throughput may go undetected until sighted. There are many times in the Northern Sound and the Strait when the weather conditions could prevent the oil from being sighted immediately.

Page 8-56 Recreation Resources. There are two state parks proposed for development in the pipeline corridor: Fort Ebey and Joseph Whidbey. (see comment under "Page 8-49 Cross Puget Sound Alternative")

A more in-depth analyses of impact of this proposed pipeline on recreation activities and resources is needed. Economic data needs to be presented.

Page 8-60 Stampede Pass Route Alternative. Lake Easton State Park would still be affected by the pipeline and the impacts are the same as those stated for the original proposal.

Page 8-61 Naches Pass Route Alternative. Federation Forest State Park will be impacted by this alternative route segment. The park is within one mile of the pipeline and is downstream from the crossings of the White and Greenwater Rivers. Impacts may be visual and aesthetic. Water quality of the rivers may be degraded. Oil spills may impact recreation.

In summary, all phases of the Northern Tier Pipeline and associated facilities may adversely impact recreation activities, specific facilities, and the natural resources that enhance recreation. The impacts may be short term, long term or permanent. The draft environmental impact statement does not provide adequate information to determine the full impact of the pipeline on recreation resources in the State of Washington. More detailed and additional information is needed in order to fully assess the impacts.

Thank you for the opportunity to review and comment on the Northern Tier proposal.

Sincerely,

David W. Heiser, E.P., Chief
Environmental Coordination

DWH/NAN:jc

cc: Mike Mills, Policy Analysis Division
Office of Financial Management

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STATE OF WASHINGTON
Dixy Lee Ray
Governor
WASHINGTON STATE PARKS AND RECREATION COMMISSION
Mail Stop KY-11

April 3, 1979

35-2650-1820
Addendum to DEIS
Crude Oil Transportation System
(E-1492)

RECEIVED
APR [illegible] 1979
POLICY ANALYSIS DIVISION

Oregon State Director
Bureau of Land Management
Northern Tier Project
Room 1250, Lloyd Building
700 N.E. Multnomah
Portland, Oregon 97232

Dear Sir:

Please consider the attached an addendum to the comments submitted by the Washington State Parks and Recreation Commission on the Northern Tier proposal for crude oil transshipment from Port Angeles, Washington, to Clearbrook, Minnesota.

As stated in the attached, the Commission has approved the study of the development of a west to east cross-state recreational trail. It is the intent of the Commission to investigate the use of abandoned railroad rights of way for this trail. In the event that the Northern Tier oil transshipment pipeline is constructed in Washington State, the Commission would like to explore the possibility of developing the cross-state trail using the pipeline rights of way.

Thank you.

Sincerely,

David W. Heiser, E.P., Chief
Environmental Coordination

er

Attachment

**L-44**
**CONT**

STATE OF WASHINGTON
Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION
[illegible] Mail Stop KY-11
Charles H. Odegaard, Director

March 27, 1979 57-080-0720

TO: Fred S. Adair, Acting Director
Washington State Energy Office

FROM: Charles H. Odegaard
Director

SUBJECT: Rights of Way and Oil Transport

This is to indicate to you that the Washington State Parks and Recreation Commission, at its March 19, 1979 meeting, approved the attached item labeled E-7 dealing with the proposed abandonment of rights of way of the Chicago, Milwaukee, St. Paul and Pacific Railroad. You will note within that item that from a recreational point of view we are most interested in having the trail in the State of Washington as well as exploring the potential possibility of having one across the United States to the midwest.

We have also indicated that there might be a possibility of using the same abandoned rights of way for the transport of oil when and if such should take place.

I also wish to indicate to you that I have assigned Mr. John A. Clark as our project coordinator concerning the trail. Should there be any possible interest in the utilization of those same lines for the transporting of oil, I would request that you be in direct contact with Mr. Clark.

er
Attachment

cc: Washington State Parks and Recreation Commissioners
John A. Clark, Capital Budget Coordinator

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STATE OF WASHINGTON
Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION
Charles H. Odegaard, Director

March 19, 1979

TO: Washington State Parks and Recreation Commission

FROM: Charles H. Odegaard, Director

RE: E-7 Recreation Trail (State and National) with Potential Financing - Requested Action

DATA:

For several years our staff has been working closely with the Interstate Commerce Commission and the railroad companies regarding the possible acquisition and recreational use of abandoned railroad rights of way. Specific successful examples of previous accomplishments include the Snoqualmie Historical Railroad done in cooperation with Burlington-Northern and the Puget Sound Railway Historical Association, and the Whatcom County trail, another cooperative venture amongst Puget Power, Whatcom County, the City of Bellingham, and State Parks.

In late 1978, we became aware of the potential abandonment of rights of way of the Chicago, Milwaukee, St. Paul Railroad. At the present time the Chicago, Milwaukee, St. Paul ownership extends from Maple Valley, Washington (near Renton) to Louisville, Kentucky. They anticipate the main line from Maple Valley to Butte, Montana to be the subject of abandonment of discontinuance of service application within three years as part of the Railroad Revitalization and Regulatory Reform Act of 1976. The main line from Butte, Montana to Jonathan, Minnesota (just outside of Minneapolis) has been identified as potentially subject to abandonment. Negotiations with Union Pacific Railroad for segments of this ownership may preclude some or all of the ownership from being abandoned and available for other uses. However, it appears possible that this project could provide two unique opportunities for the Commission's consideration (see Attachment E).

State Parks does not now have sufficient data concerning the lines in or out of state to make any specific proposals. However, we are all aware that for some time both SCORP and State Parks' long-range plans call for the acquisition and development of an east/west cross-state trail to complement the Pacific Crest National Scenic Trail. Further, the nationwide plan also speaks to the need for a nationwide east/west trail.

Such a trail, even if only within the State of Washington, could rival the Lewis and Clark and Oregon Trails. Historically the railroad chose the easiest grades; ones that might also provide for people in nine or ten states to use the trails for Nordic skiing and snowshoeing in the winter, and hiking and horseback riding in the summer, with hosteling year round. There would also be excellent opportunities for historic preservation and interpretation. Such a program, if attempted along the entire route, would need to be coordinated amongst the many states and the involved federal agencies.

For such a trail to become a reality, regardless of its length, the issue of financing needs to be discussed and researched - financing to determine the identity of the lines, financing to provide an analysis of the lines and adjacent properties, financing to determine the feasibility of the various proposals, financing to determine trail implementation cost estimates, etc.

It appears that the project solely within the boundaries of the state can and should be pursued by our own State Parks' staff. However, the total project needs to be handled on a national scale as was done in 1964 when the United States Congress created the Federal Lewis and Clark Trail Commission, composed of representatives of Congress and the several states along the trail.

One special thought that should be embodied within your considerations because of its timeliness is oil transshipment.

For some time there has been considerable discussion concerning oil - Alaskan oil: discussion as to how to get oil out of Alaska, discussion as to whether the oil should be allowed to be tanked/piped into our state as a storage and/or transfer site, and discussion as to how to have the oil moved to the central and eastern parts of the United States.

The purpose of this portion of the Commission item is not to address whether the storage and/or transfer of oil should or should not be authorized in our state but, rather, to discuss a potential way to have the oil transported east, if it is allowed in and/or through our state, and how to accomplish this with maximum recreation benefits (note Attachments A, B, and C as they relate to the Pacific Northwest and Attachment D as it relates to the State of Minnesota).

It might well be that the long-discussed and seemingly always controversial pipeline could be laid underground along this trail, with the surface being prepared as a trail by the companies transmitting the oil at no cost to the public recreation agencies. This should provide desirable offsetting benefits to the companies, thus mitigating any adverse impact of the lines on aesthetics (see Attachment F).

Following review, staff has determined that the action proposed by the Commission is exempt from the State Environmental Policy Act of 1971 under WAC 352-10-170(8).

REQUESTED ACTION:

That the Washington State Parks and Recreation Commission:

1. Adopt the concept of a Washington State east/west recreation trail utilizing the rail beds of the proposed abandoned lines, and authorize the director or designee to pursue the feasibility and to report back to the Commission prior to any commitments for acquisition or development.

2. Adopt the concept of an east/west recreation trail from the State of Washington to the midwest utilizing the rail beds of the proposed abandoned lines, and authorize the director or designee to pursue the feasibility with the appropriate state and federal officials.

3. Authorize the director or designee to suggest to the appropriate authorities the potential joint oil pipeline/recreation trail concept within either/or both programs.

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**L-45**

United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
DES 79-3

APR 03 1979

Memorandum

To: Director, Bureau of Land Management

From: Deputy Director for Programming

Subject: Review of draft environmental statement, Bureau of Land Management, for Crude Oil Transportation System Proposal by Northern Tier Pipeline Company, Port Angeles, Washington, to Clearbrook, Minnesota

The Heritage Conservation and Recreation Service administers several programs which affect or may be affected by the Northern Tier Pipeline Company Crude Oil Transportation System proposal. Namely, the National Historic Landmarks, National Natural Landmarks, the transfer of lands for recreation or historic purposes pursuant to the Surplus Property Act, Section 6(f) of the Land and Water Conservation Fund, and Section (4f) of the Department of Transportation Act. Our review relative to these interests indicates that the proposal's impact on the foregoing is substantial except at termination in the state of Minnesota as reported to you by our Ann Arbor, Michigan office. Additional comments received from HCRS Denver, Colorado, and Seattle, Washington Regional offices and from the Departmental Consulting Archeologist are enclosed. Generally, they conclude:

a. The DES lacks full descriptive and comparative information relative to impacts,

b. the DES is seriously void of measures to mitigate adverse impacts on visual resources, and

c. the proposal has far reaching consequences and impact on the area's visual resources, natural resources and the recreation environment.

Thank you for the opportunity to comment.

Harold Greenly [illegible]
Paul C. Pritchard

Attachment

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**CONT**
**A**

United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
NORTHWEST REGION
SEATTLE, WASHINGTON 98174

IN REPLY REFER TO:
ER-7
79/3

Memorandum

To: Director

Attention: C. Key, Division of Environmental & Compliance Review

From: Regional Director, Northwest Region

Subject: Review of draft environmental statement, Bureau of Land Management, for Crude Oil Transportation System Proposal by Northern Tier Pipeline Company, Port Angeles, Washington, to Clearbrook, Minnesota

As requested in your special instructions dated February 8, 1979, we are enclosing our comments on the subject DES for inclusion in the consolidated HCRS comments.

GENERAL COMMENTS

① Considered in total, the proposal would have a major adverse impact on the recreation environment. A serious shortcoming of the DES is its failure to describe, except very briefly, impacts of proposals other than those by the Northern Tier Pipeline Company (NTPC). These impacts should be fully described and compared to those expected from NTPC's proposal, particularly for those viable alternatives which may be less damaging to the environment.

② Of special interest is the SOHIO proposal, to run from Long Beach, California, to Midland, Texas. This route would be 530 miles shorter than the NTPC proposal, would require only 237 miles of new pipeline compared to 1,557 miles for the proposal, and would cost less than half as much. The SOHIO route would cross primarily open, arid country, contrasting with the NTPC route across forested mountain ranges. Visual impacts and potentials for stream, marine, and biological degradation presumably would be far less than those of the proposal, but the DES does not provide a comparison.

③ CEQ regulations for implementing NEPA (Federal Register, Wednesday, November 29, 1978, Part VI) are clear in requiring a full comparison of relative impacts. Section 1502.14 states, in part (emphasis added):

> This section is the heart of the environmental impact statement. ...It should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public. In this section agencies shall:
>
> (a) Rigorously explore and objectively evaluate all reasonable alternatives.
>
> (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
>
> (c) Include reasonable alternatives not within the jurisdiction of the lead agency...

Considering the project's far-reaching effect on the recreation environment, and in keeping with the above CEQ requirement, we feel that a detailed comparison of environmental impacts of the proposed project and all viable alternatives is essential. We also feel this information should be made available during the review process, prior to preparation of the final statement. Section 1502.9(a) of the CEQ regulations cited above states, in part, "The draft statement must fulfill and satisfy to the fullest extent possible the requirements established for final statements...if a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate action." We feel that without an appropriately detailed comparison of impacts from all viable alternatives, a meaningful analysis to determine the environmentally preferred alternative cannot be made.

The greatest single adverse impact of the proposal on the general public and for recreationists probably will be its visual changes to the landscape and vegetation. The DES lacks sufficient detail on the nature and extent of visual changes along the pipeline route and across parks and recreation areas, and is entirely lacking in measures to mitigate these changes. This may be due in part to the lack of an exact alignment within the proposed two-mile-wide corridor. We feel this information, as described in our detailed comments, should be made available in the final statement.

The lack of an exact proposed alignment for the pipeline right-of-way in the DES has precluded a complete description of impacts to park and recreation areas and to cultural resources. In our opinion, the final statement must contain this information in order to comply with NEPA's requirement for a detailed statement on the environmental impact of the proposed action.

DETAILED COMMENTS

④ Page 2-115; Visual Resources, Segment 2. We do not agree with the moderate to low sensitivity and low scenic quality ratings for the Puget Sound lowlands segment. While these ratings would be accurate for portions of the area, other portions should be rated moderate to high for both categories. Examples are the Green River Gorge, other streams and much of the rural agricultural land which has escaped noncompatible development. Esthetically, such areas are very important to local citizens because of the contrast they give to developed areas and their importance should not be masked by assigning one overall scenic quality rating to the segment.

Although the local population density is relatively sparse in portions of the area and may rate a low or moderate sensitivity rating now, the region is urbanizing rapidly. Sensitivity ratings should take into account probable changes in population densities and access during the life of the project, and be upgraded where appropriate.

⑤ Page 2-139; Plains to Townsend, Montana. The National Trails System Act was amended by P.L. 95-625, November 10, 1978, to include the Continental Divide National Scenic Trail and the Lewis and Clark National Historic Trail. Reference to these two trails should be corrected in the final statement.

⑥ Pages 3-1 to 102; Environmental Impacts... Pursuant to authority contained in the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461), the Department of the Interior administers and implements a natural areas program, including the National Registry of Natural Landmarks. The FES should describe probable site-specific impacts of the pipeline and related facilities where located on or near enough to affect designated or potential National Natural Landmarks. We have identified the following potential landmarks which occur along or near the proposed route; any changes in the route could impact other areas:

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**CONT**

⑥

| Name of Area | Counties |
|---|---|
| Washington | |
| Black River Swamp | Thurston |
| Millersylvania State Park | Thurston |
| Weir Prairie | Thurston |
| West Bar | Kittitas |
| Quincy Scabland | Grant |
| Sprague Channeled Scabland | Adams, Lincoln, Spokane, and Whitman |
| Turnbull Pine Research Natural Area | Spokane |
| Idaho | |
| Killarney Wildlife Management Area | Kootenai |

The BLM should contact field offices of the Heritage Conservation and Recreation Service for descriptions of these areas.

⑦ Pages 3-35, 3-36, 3-94, 3-95, 4-4, 4-5; Cultural Resources. The first paragraph on page 3-35 states there will be no direct impact to any known cultural properties. This statement is apparently contradicted on page 3-36 which says (first complete paragraph) that historical resources could be affected directly by disturbance of sites or structures. The contradiction should be reconciled in the final statement

The DES does not provide any site-specific information on probable direct or indirect impacts on cultural sites. One reason for this evidently is the lack of an exact proposed right-of-way alignment. Another is the general lack of surveys, particularly to identify archeological resources, along the proposed route. It is our opinion that impacts to specific, significant cultural properties must be described in the final statement in order to satisfy the NEPA requirements. The information on these impacts logically would come from implementing procedures required by 36 CFR 800, particularly identification of properties eligible for inclusion in the National Register of Historic Places and determining the effect of the proposal on these properties. Section 800.4, 36 CFR 800, requires these procedures be followed "At the earliest stage of planning or consideration of a proposed undertaking..."

The DES states (page 4-4) that compliance with Section 106 of the Historic Preservation Act (and, therefore, with 36 CFR 800) cannot be accomplished before completion of the environmental statement. A proposal is given for carrying out these procedures prior to and during ground disturbance activities. This approach, in our opinion, constitutes a deviation from requirements of both NEPA and 36 CFR 800. For this approach to be acceptable, the final statement should contain evidence of approval by both the Council on Environmental Quality and the Advisory Council on Historic Preservation. The FES also should document consultation with all State Historic Preservation Officers along the route, particularly with regard to specific needs for surveys to identify historical and archeological properties eligible for inclusion in the National Register.

⑧ Pages 3-47 to 49, 3-112 to 118, 4-8; Recreation Resources. The DES lists parks and wildlife areas that will either be crossed by the proposed pipeline or that are within the 2-mile corridor and could be indirectly affected. Descriptions of impacts are very brief. The final statement should describe in detail all direct and indirect impacts on designated park and recreation areas and wildlife areas that are also used for recreation. The descriptions should include maps and illustrations of individual areas showing pipeline impacts. Specific information should be given on right-of-way widths and location, type and appearance of facilities, impacts on vegetation and landscape, and the nature and extent of impacts on recreation use.

Certain of the recreation and wildlife areas along the proposed route (Green River Gorge Conservation Area, Colockum and Oak Creek Game Management Areas, and Gloyd Seeps Wildlife Recreation Area) have been partially funded with monies from the Land and Water Conservation Fund (L&WCF). Final route selection could result in impacts to other L&WCF-funded areas as well. Section 6(f)(3) of the L&WCF Act places the following restrictions on conversion of funded properties to other uses:

> No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.

In addition to designated park and recreation areas, the proposed pipeline would cross certain lands which have high scenic and recreation value although not designated as park and recreation areas. Examples include the segment of proposed corridor west of Hood Canal and in the Snoqualmie Pass Area. The final statement should describe probable impacts in these areas at a level of detail suggested above for designated areas.

The DES mentions recreation use of the corridor along some segments, but not in specific terms. For example, pages 3-113 and 114 predict use of the corridor in the Snoqualmie Pass area by snowmobilers and other off-road vehicles, cross-country skiers and hunters. The extent to which this is true will depend on such factors as grade, scenic attractions, presence of other access corridors, and permission of landowners. Use of the corridor by off-road vehicles could also cause erosion problems and conflicts with non-motorized recreationists and residents. The final statement should discuss these considerations relating to potential recreation use of the corridor in areas where the corridor might be expected to prove attractive for such use.

The final statement should describe specific mitigation measures to be followed, on a case-by-case basis, where the pipeline will cross designated park and recreation areas and also non-designated areas that possess recreation value. The DES lists three mitigation measures that could be conditions of the permit; we recommend that these and other measures as appropriate be so incorporated as permit conditions. We suggest two additional measures: provision for use of the right-of-way by recreationists wherever possible, and erection of gates or barriers where necessary to prevent user conflicts or resource damage.

⑨ Pages 3-96 through 106, 4-5; Visual Resources. For most people, the most obvious adverse impacts of the project will be visual. The DES provides general information on visual impacts but very little detail. Detailed information that should appear in the final statement includes mileages and locations of segments where the pipeline will: follow existing rights-of-way, parallel existing rights-of-way, and follow new rights-of-way. The visual impacts of these three situations should be described, compared, and illustrated. The descriptions should include site-specific information on necessary clearing for the pipeline and related facilities. Adverse visual impacts will be greater for recreationists where the pipeline crosses or is visible from designated park and recreation areas and other non-designated areas that receive recreation use; these segments should receive special attention in the FES.

The DES presents no measures to mitigate adverse impacts on visual resources, which we consider to be a serious omission. We urge maximum use of design and location techniques to minimize adverse visual impacts. These should include maximum dual use of existing utility and transportation corridors. This is particularly important in forested areas to reduce the need for highly visible initial and maintenance clearing of vegetation. Where new right-of-way can not be avoided, it should be located and cleared according to latest landscape techniques to hide and soften edge and linear effects and to otherwise reduce visible change from natural conditions. All cleared areas should

L-45 CONT

9 be revegetated to the maximum extent possible, commensurate with facility inspection and maintenance. Facilities should be blended with their surroundings through suitable design, location, coloring, and other techniques. Techniques used in location and design of transmission lines may be useful; we suggest that BLM contact the Bonneville Power Administration in this regard. The final statement should be explicit as to the nature and extent of mitigation measures that will be followed.

10 Pages 3-96; Visual Resources; Summary. The DES states that visual impact of the corridor in the Snoqualmie Pass and Coeur d'Alene River areas will be high during construction, declining to moderate beyond the life of the project, but does not evaluate impact during operation. The final statement should state that visual impacts, wherever the project involves clearing of forest land, will remain high during the life of the project. This point should also be discussed under Operation Phase, page 3-97.

11 Page 3-96; Visual Resources; Pipeline Right-of-Way. The reference to revegetation along the right-of-way through forest land should be explained relative to intended clearing maintenance.

12 Page 3-97; Visual Resources; Segment 1, last paragraph. According to the DES, visual contrast at certain named rivers would not persist because of the softening effect of revegetation. This should be explained and related to plans for vegetation clearing during operation. See similar comments for page 3-96.

This segment of the pipeline would traverse particularly scenic terrain in the vicinity of Discovery Bay and Hood Canal. The mix of mountains, forest and saltwater, and proximity to a large metropolitan area, give this part of the Olympic Peninsula special visual significance for travelers and recreationists. These attributes should be better recognized in the final statement and the description and seriousness of impacts should be given more emphasis.

13 The BLM should be aware of the Manis Mastodon Site, located south of Sequim, and should take measures to avoid any adverse impacts. This particularly important archeological site has been included in the National Register of Historic Places.

14 Page 3-98; Visual Resources; Table 3.2.11-1, Visual Impacts on Vegetation Patterns. Visual contrast ratings appear too low for coniferous forest, Ponderosa woodland, and deciduous forest columns. We would assign maximum ratings to all new clearing in all forest types, unless evidence can be presented otherwise. Somewhat lower ratings could be assigned to new clearing adjacent to existing rights-of-way, but not as low as those indicated.

15 Page 3-100; Segment 3. The first sentence states that this segment would not be visually evident. This conflicts with the rest of the paragraph which speaks of new right-of-way through dense forest in a highly scenic and visually sensitive area.

16 Pages 3-100, 101; Segment 6. The text discusses a 22-mile section of the route which will involve a new right-of-way through steep forest lands and 24 crossings of the North Fork of the Coeur d'Alene River. If this section alone were an individual project, impacts would be significant enough to require preparation of an environmental statement. Yet, the discussion of visual impacts in the DES amounts to only half of one page. The final statement should contain a detailed description of impacts in this area, including information suggested for pages 3-47 to 49 and 3-112 to 118.

17 Page 3-106; Abandonment Phase. The DES states that at abandonment it is assumed that the pipeline, pump stations, and block valves would be removed. We suggest that consideration be given to making removal of visible facilities a condition of the permit.

18 Page 3-110; Electric Transmission; Construction. The first complete paragraph says that right-of-way sharing might lessen the land-use impact, but the extent of sharing cannot be determined until more detailed studies are completed. As we have indicated previously (comments for pages 3-96 through 106, 4-3), detailed information on dual use to be made of existing rights-of-way should appear in the FES. We urge such dual use to minimize adverse impacts on the recreation environment.

19 Page 3-112; Recreation Resources; Summary; 2b. The "proposed" notation should be deleted from the Continental Divide National Scenic Trail and the Lewis and Clark National Historic Trail.

20 Page 4-1; Mitigating Measures... The DES does not propose specific mitigating measures because project design and location is not specific. The final statement should contain a detailed, site-specific description of how adverse impacts will be mitigated. Our views on appropriate mitigation are presented previously, under comments on cultural, visual and recreation resources.

for Maurice H. Lundy
Regional Director

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B

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
MID-CONTINENT REGION
DENVER, COLORADO 80225

DES-79/3

1979

Memorandum

1 To: Chief, Division of Environmental and Compliance Review

From: Assistant Regional Director, Land Use Coordination

Subject: Review of draft environmental statement for Northern Tier Pipeline Crude Oil Transportation System

Several park and recreation areas are located within the proposed corridor. Some of these areas have received matching assistance from the Land and Water Conservation Fund (L&WCF) for the acquisition of lands and/or development of facilities. These L&WCF areas are:

Rusnaver Park, SW¼ Sec. 9 T20N R26W, Sanders County, Montana (mile 554)

Placid Lake, areas at the north and east ends, Missoula County, Montana (mile 631)

Salmon Lake, east shore at the junction of T15N and T16N, Missoula County, Montana (mile 635)

Murphy Tracts, near the junction of Cottonwood Creek and the Blackfoot River, Powell County, Montana (mile 643)

Monture Fishing Access Site, SE portion Sec. 22 T15N R13W, Powell County, Montana (mile 647)

Blackfoot River Junction Access, SE corner Sec. 8 T14N R12W, Powell County, Montana (mile 653)

CONT 1

Lewis and Clark County Fairgrounds, on the northwest edge of Helena, Montana (mile 715)

Canyon Ferry Lake and adjacent shoreline recreation areas, Broadwater County, Montana (mile 750)

Selkirk, Sec. 9 T8N R12E, Wheatland County, Montana (mile 818)

Spring Lake, SW¼ Sec. 36 T155N R101W, Williams County, North Dakota (mile 1161)

Stanley Community Recreation Park, immediately south of Stanley, Mountrail County, North Dakota (mile 1221)

Mouse River Forest Park, southwest portion of Sec. 31 T157N R75W, McHenry County, North Dakota (mile 1313)

Turtle River State Park, Grand Forks County, North Dakota (mile 1157)

Several park and recreation areas within the towns of Thompson Falls, St. Ignatius, Helena, East Helena and Townsend in Montana, and Epping, Stanley, Berthold, Towner, Rugby, Knox, Leeds, Lakota, Michigan and Petersburg in North Dakota

We expect that the centerline of the pipeline can be adjusted during final design stages to minimize impacts to public recreation areas. However, if use of land from a L&WCF area is found to be unavoidable, you should be aware that park and recreation areas receiving monies from the Fund are subject (in their entirety) to the provisions of Section 6(f) of the L&WCF Act, as amended. This section of the Act requires that changes from the recreational use of the land be approved by the Secretary of the Interior. Any request for a change in land use must be initiated by the appropriate project sponsor through the State Liaison Officer (SLO) for the State. The SLOs can also provide more detailed information on the locations, boundaries, and sponsors of the projects. The Montana SLO is Mr. Ron G. Holliday, Administrator, Parks Division, Montana Department of Fish and Game, 1420 E. 6th Avenue, Helena, Montana 59601. The North Dakota SLO is Dr. Robert M. Horne, Director, North Dakota Department of Parks and Recreation, Route 2, P.O. Box 139, Mandan, North Dakota 58554.

The proposed pipeline route crosses the Glacial Lake Missoula National Natural Landmark, which occupies Section 31, T21N R23W, in Sanders County, Montana (mile 569 to mile 570). This Landmark includes the largest and finest examples of giant flood ripples known in North America. Therefore, we recommend that the pipeline route be adjusted to avoid the designated area. If this is not possible, careful restoration of the existing vegetation and contours should mitigate the effects of pipeline construction.

Robert J. Arkins

Robert J. Arkins

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C

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

MAR 22 1979

Memorandum

To: Chief, Division of Environmental Compliance and Review

From: Departmental Consulting Archeologist

Subject: Draft Environmental Statement (DES 79/3), Crude Oil Transportation System: Port Angeles, Washington to Clearbrook, Minnesota

1 Our comments are shaped by specifications detailed in the Council on Environmental Quality (CEQ) Guidelines and by the requirements of the National Historic Preservation Act of 1966 (NHPA) and Executive Order 11593. We express concern that these guidelines and requirements have not been followed. CEQ states that a DES should (1) consider alternatives; it must study, develop, and describe these alternatives, (2) it should not commit resources prejudging alternatives, and (3) it should serve as a means of assessing alternatives rather than justifying decisions already made. In order for the Bureau of Land Management (BLM) to comply with NHPA and Executive Order 11593, it is essential that information is collected that allows alternative evaluation prior to alternate selection. We believe that information adequate for this task has not been collected.

While the DES studies alternatives, it provides no means to assess them. Only known sites are listed under each alternative; predictive statements based upon statistically representative samples are not offered. Such statements are essential for alternatives evaluation. The lack of these statements leads us to question the level of input cultural resources evaluation will have into determining the final route selection.

Problems stemming from the lack of predictive information can be illustrated by the statement on page 3-94, "The numbers of all types of known cultural resource localities will certainly increase when systematic field inventories are accomplished. Because the precise alignment of the proposed pipeline is not yet known there are no identified direct impact areas." If predictive surveys had been conducted for each alternative, informed decisions reducing the potential for impacting unknown sites could be reached. Without predictive survey information BLM is reduced to making general and uninformed statements.

2 Similarly, on page 2-155, "It is inevitable that the total resource base will shrink to some extent through deliberate and inadvertent destruction of sites which may be either known or unknown." While some sites may be destroyed, either through inadvertent destruction or deliberate data recovery, we believe that site destruction would be reduced if sufficient survey had been done during DES preparation. The fact that predictive surveys were not conducted contradicts the intent of CEQ Guidelines and increases the likelihood of unwarranted sites destruction, sites that could have been avoided had adequate information been available prior to final route selection. Such destruction and lack of planning is inconsistent with the intent of NHPA and Executive Order 11593.

3 The danger of making decisions based upon poor information is compounded by BLM's approach to determinations of adverse affects (page 4-5). Paragraph D(1) states that when it is neither prudent or feasible to avoid a cultural resource and, "If it is determined that the cultural resource which would be affected was eligible for inclusion in the National Register, solely because it might yield information important in prehistory or history, BLM would require the applicant to develop and implement a data recovery program . . . in accordance with Part II of the Advisory Council's Guidelines for making Adverse Effect and No Adverse Effect Determinations for archeological resources in accordance with 36 CFR 800." The latest published version of 36 CFR 800 states that these guidelines are under review by the Council's Task Force on Archeology and will be revised based upon Task Force recommendations. The Task Force is considering the recommendations of The Fort Burgwin Conference on National Archeological Policies, a group composed of both government and academic archeologists. The Conference recommended that preservation is the preferred conservation approach and that data recovery should be employed only when no prudent or feasible alternative exists. We support this position and believe that information presented in the DES does not allow planners to reach decisions based upon good evidence that no prudent or feasible alternative exists. This situation could have been ameliorated had predictive surveys of each alternate been conducted.

In addition to the basic problems raised above, we express the following concerns:

4 1. No cultural resources are listed under the Stampede Pass alternate (page 8-57). If no known sites were located during DES preparation, it should be so stated.

5 2. There is no mention of the possibility of encountering underwater sites in areas of proposed tanker unloading facilities or underwater pipelines. Because sea levels have changed since the last glaciation, the possibility of impacting underwater sites should be stated and evaluated.

6 3. There is no mention of impacts resulting from construction and maintenance of temporary work camps along the pipeline right-of-way. If camps are planned, their known and potential impacts on cultural resources must be evaluated.

Rex L. Wilson

Rex L. Wilson

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L-46

United States Department of the Interior

NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
L7619(135)

APR 5 1979

Memorandum

To: Director, Bureau of Land Management

From: Deputy Director, National Park Service

Subject: Draft Environmental Statement for Proposed Crude Oil Transportation System, Port Angeles, Washington, to Clearbrook, Minnesota (DES 79-3)

The National Park Service has reviewed the draft environmental statement on the Northern Tier Pipeline. We are concerned that the Northern Tier Pipeline proposal may have significant adverse impacts on lands presently administered by the National Park Service or under study for possible inclusion in the National Park System, the Wild and Scenic Rivers System, or the National Trails System. We underscore the need for additional analysis to identify and assess these impacts, and to develop mitigation measures for reducing, and if possible, eliminating them. We further believe that additional analysis will be required for the Foothills alternatives, which could have significant impacts on the resources of two National Park System units in Southeast Alaska. We recognize that it appears to be in the national interest to expedite implementation of an effective crude oil transportation system, and we look forward to working with you to ensure that the system eventually selected will entail the least possible impact on the significant natural, cultural, and recreational resources administered by the National Park Service.

Our general and specific comments below are organized according to existing or potential NPS-administered units affected.

1. NORTHERN TIER PIPELINE

A. Olympic National Park, Washington

Based on our review of the environmental impact statement and supporting technical documents and our mandate from the Clean Air Act Amendments of 1977 (P.L. 95-95), the National Park Service is concerned that the Crude Oil Transportation System as proposed by Northern Tier Pipeline Company risks the possibility of significant deterioration in air quality related values including visibility in Olympic National Park.

The Clean Air Act Amendments of 1977 (P.L. 95-95) charge the National Park Service with an affirmative responsibility to protect air quality related values, including visibility, of Class I areas. To fulfill this mandate for Olympic National Park in the review of the subject statement, additional technical expertise was needed. Therefore, Dr. Franklin I. Badgley, Professor and Chairman of the Department of Atmospheric Sciences; Dr. August T. Rossano, Professor of Air Resources Engineering; Dr. Alan P. Waggoner, Associate Professor of Civil Engineering; and Gilbert McCoy, graduate student in the Air Resources Program of the Department of Civil Engineering, University of Washington, under contract reviewed the draft environmental statement and the technical data prepared by Science Applications, Inc. (SAI). Their comments are referenced below.

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1. *Major concerns*

Air Quality Related Values: *A great deal of attention is directed to the* allowable Class I increments, but the effects of air pollution on air quality related values in Olympic National Park are ignored. Even if the increments for sulfur dioxide and particulates are met, harmful effects of air pollution on air quality related values in the park would not be acceptable.

Visibility: Air quality monitoring data in the draft environmental statement are insufficient to enable prediction of the extent of impairment of visibility resulting directly and indirectly from the proposed construction and operation phases of the project.

Modeling: The National Park Service has reservations concerning air pollutant modeling results as presented in the draft environmental statement. To some extent the deficiencies have a cumulative effect which we contend seriously limits the usefulness of the models in predicting potential impairment of air quality in Olympic National Park.

a Emissions: McCoy and Rossano (1979) point out in the enclosed comments that the Reid Vapor Pressure selected by the applicant is probably too low (Comment #2). Their Comment #6 regarding storage losses from tanks which are painted a color other than white must also be taken into account. These problems suggest that hydrocarbon emissions should be revised upward in the final environmental statement.

b McCoy and Rossano also state that the averaging method used to derive emissions from tankage does not produce realistic worst case emission values (Comment #3). Moreover, they raise significant questions on ballasting emissions (Comment #4) and venting (Comment #7). These deficiencies also require further study and discussion in the final environmental statement as they affect hydrocarbon emissions.

c Energy: The final environmental statement should address the applicant's proposed plan for providing power for operations in the event that electrical energy shortfalls develop during the life of the project. If these generation facilities (standby generators) produce air pollutants or if revised operating procedures would lead to increased emissions, air quality impacts would have to be reevaluated (Comment #1, McCoy and Rossano, 1979, enclosed). Also, the likelihood of growth of industry in Port Angeles as a result of the proposed facility would add to the air pollution burden in the area.

2. General comments

Air Quality Related Values

The draft environmental statement provides modeled "data" on existing $SO_2$ concentrations in Olympic National Park adjacent to Port Angeles for periods of 24 hours and less. Otherwise, baseline air quality in Olympic National Park is undocumented; therefore, the existing air pollutant stress on air quality-related resources is not known. It is currently assumed by the National Park Service that lichens and bryophytes are the biological resources which are most sensitive to air pollution in Olympic National Park. The lichen flora is diverse, constitutes an important portion of the total ecosystem, and consists in large part of foliose or fruticose types which are demonstrably sensitive to chronic $SO_2$ concentrations on the order of $10\,\mu g/m^3$ in other areas. At Sudbury, Ontario, for example, $SO_2$-related depletion of lichens begins at approximately $10\,\mu g/m^3$, and at $30\,\mu g/m^3$ $SO_2$ the number of lichen species on tree bark is reduced by approximately 20 percent.

If the existing annual average concentration of $SO_2$ in the Heart O' the Hills Parkway sector is $10\,\mu g/m^3$, this would suggest an existing baseline at the limit of tolerance for sensitive species. If the proposed project were to add $2\,\mu g/m^3$ $SO_2$ (the Class I Prevention of Significant Deterioration Increment), raising the chronic level to $12\,\mu g/m^3$, sensitive lichen species may be eliminated from that part of the park. Hemrick (1942) lists 146 species for the Park, 82 of which occur in the same elevation range as the Heart O' the Hills Parkway.

Of course, the actual scenario would depend upon actual $SO_2$ concentrations and sensitivities. The final environmental statement should assess the magnitude of this impact using monitoring data as it becomes available from Environmental Research and Technology's air monitoring stations now in the Park.

The draft environmental statement dismisses calculated exceedence of the National Ambient Air Quality Standard (NAAQS) guideline for hydrocarbons by stating that the calculated emissions would not affect human health. In view of the relatively high concentrations of hydrocarbons calculated for the Port Angeles area, it seems important to address the question of possible impacts upon resources in Olympic National Park in the final environmental statement.

The transport of hydrocarbons into Olympic National Park and projection of reaction with ozone and nitrogen dioxide is not covered in the statement. Hydrocarbons, ozone, and other air pollutants should be monitored in the area of impact for one year to adequately define existing levels and to make possible projections about the impacts of increased levels resulting from the proposed project on air quality related values including visibility in the Park. The results of such monitoring should be a primary factor in determining the nature of mitigation measures to be implemented during the construction and operation of the project.

Visibility

Data on average and extreme values in Olympic National Park of airborne particulates loading in the size range 0.1 to 2 um diameter or nephelometer measurements of scattering coefficients or contrast transmittance measurements from telephotometric determinations would be needed to characterize the existing condition before modeled increases in particulate concentrations could be used to reasonably estimate the extent of the impact.

d Waggoner (1979) concludes that, based on assumed validity of data in the draft environmental statement, visibility impairment in Port Angeles may be increased by 10 to 30 percent over the existing condition, as a result of the proposed project. His analysis is enclosed, and the National Park Service concludes that it raises significant questions, the most equivocal interpretation being that the draft environmental statement does not show whether or not visibility would be impaired within Olympic National Park.

Moreover, uncertainties and possible errors in the modeling, assumptions, and emission factors raise the significant possibility that this estimated visibility impairment is based on modeled increments that are too low. These questions are discussed below under modeling.

Modeling

Data Base: At least some synoptic meteorological analysis is needed to enhance the credibility of the modeling. The "straight line" nature of the plumes in the Map Addendum is contrary to the expected behavior of air flow over irregular topography, and it seems likely that some modeled plume centerlines would at times intersect the Heart O' the Hills Parkway. We recommend that the modeling be redone using data now being collected by Environmental Research and Technology.

e The apparent absence of atmospheric temperature sounding data for the Port Angeles area seriously limits the credibility of selected dispersion coefficients and model results. Application of such data from the Seattle

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e area probably underestimates the stability to be expected during summertime and in daylight hours under the more maritime conditions at Port Angeles. Rather than suggest that a protracted series of meteorological tower measurements be conducted, we recommend a limited number of aircraft and PIBL temperature soundings be made at times of expected stagnation and low velocity northerly winds. (See Waggoner, 1979)

Meteorology: A very important concern arises from the lack of discussion of the diurnal motions of air and development and breakup of inversions in the Port Angeles area. It should be discussed whether or not light winds from the south flow at night (as the land cools) would carry air pollutants into a stable layer developing during the dark hours over the Strait of Juan de Fuca. Moreover, would it be reasonable to expect a reversal in flow shortly after dawn, bringing the stable air (and pollutants) ashore? Warming of the surface would then break up such an inversion, causing fumigation of the surface as the stable air overturned.

The National Park Service would like to see this situation evaluated at least in a preliminary fashion to see if conclusions in the draft environmental statement would be significantly changed. The Environmental Protection Agency conducted a detailed analysis of the potential for fumigation by Turbulent Internal Boundary Layers (TIBLs) for the final environmental statement for the Pittston, Maine, tanker facility.

Method of Analysis: The discussion of air quality modeling analysis appears to use Heart O' the Hills as the distance standard for predicting the effect of the project on Class I standards relevant to Olympic National Park. This fails to account for the parkway which is located several miles closer to the proposed terminal.

A statement is needed which gives a reliable estimate of the magnitude of the error in calculating ground level concentrations. Waggoner (1979) states that the "accuracy may be no better than a factor of 10", so that 24-hour $SO_2$ concentrations from the proposed project which modeling showed as approximately 20 $\mu g/m^3$ near Lake Dawn could conceivably be as high as 200 $\mu g/m^3$.

Serious deficiencies with the complex terrain model may exist due to unrealistic plume trajectories. Waggoner (1979) discusses the problem in his enclosed comments and shows that it imposes errors which cannot be presently assessed. Other sources of error are listed by Waggoner under D. Model Calculations and E. Modeling Summary. These questions need to be answered and appropriate corrections applied in the final environmental statement.

3. Specific comments

Summary

② Page 29. The photo of the Green Point facility is misleading since it shows only 11 storage tanks and a cut. It omits the clearing needed for the tanks, the seven additional tanks for the 933,000 bpd for Phase II, and the additional seven tanks for the 1,283,000 bpd Phase III. To display the full impact of the facility, the photo should include twenty-five tanks, roads, pump station, and other associated facilities plus the required clearing. The 285-foot diameter tanks should be rendered to scale.

Environmental Statement

③ Summary page: Adverse impacts should include major impacts on existing industries in Port Angeles, especially Crown Zellerbach and ITT Rayonier.

Page 1-5. The correct legal reference for the National Park Service is the Clean Air Act Amendments of 1977 (P.L. 95-95). The activity requiring approval is construction of a major emitting facility near a Class I area. Form of action is consulting.

Page 1-50. Although the project has an expected life span of 20 years, it is stated here that the tanker berthing structures would probably not be taken out of service. The reason for this should be explained. It suggests that they would be supporting other industries. If so, such information should be included in the final statement. The possibility of this project being an attractant to other petroleum-based industries such as refineries and fertilizer plants should be fully analysed since such developments would have additional impacts on Port Angeles and Olympic National Park.

Page 1-56. Twenty-eight measures to decrease adverse impacts of the proposal are listed; however, there is no discussion of who has the responsibility to ensure that these measures are, in fact, implemented. Other measures mentioned in the text, such as low sulfur bunker fuel for tankers in port, are presented as Northern Tier Pipeline Company requirements (Page 3.3) and as stipulations by the Environmental Protection Agency, but enforcement responsibility is not mentioned. Will bonding be required of NTPC to cover costs of damage caused by construction and operation of the project? Who will see to the proper removal of equipment and facilities upon project abandonment? Will bonding be required for this function too? The whole area of enforcement and accountability should receive more attention in the final statement.

Page 1-57. NTPC will require tankers to use fuel of 1 percent sulfur during in-port operations. On page 5-1, an analysis is reported which concluded that sulfur content would have to be limited to 0.5 percent to meet Class I air quality increments in Olympic National Park, but the limits EPA will set on sulfur are not known; therefore, there are no definite commitments made in this statement to limit the amount of sulfur in fuel burned by the tankers. Such limitations must be known before $SO_2$ increments in the park can be determined.

Page 1-59. The statement of impact on the National Park Service is not correct. It should state how often sulfur dioxide will exceed the maximum allowable increase in Olympic National Park. Pure air policies are not those of the National Park Service but are those set forth by the Clean Air Act Amendments of 1977 (P.L. 95-95).

④ Page 2-2. Discussion implies that wind direction data for stable atmospheric conditions at Port Angeles are insufficient for realistic modeling of dispersion.

Inversion height data appear insufficient for a project of this magnitude. It would be pertinent to include data on minimum mixing heights as well as that given for maximum mixing heights.

It is noted that no mention is made of Turbulent Internal Boundary Layers (TIBLs) and their dynamics during periods of surface warming. We recommend analysis similar to that done in the final version of the environmental statement for the Pittston, Maine, project.

⑤ Page 2-4. National monuments, primitive areas, etc. can be redesignated only to Class I since they are presently Class II floor areas.

The boundary of Olympic National Park is said to be on a map in the addendum; however, there is no map in the addendum which accurately and clearly shows the park boundary.

⑥ The source for Table 2.1.1.2-2 should be Volume 42, not 2.

a Page 2-5. The photos of existing plants in Port Angeles are misleading, since clouds of condensed water vapor are mistakenly labeled as smoke. On page 21 of the Summary, water vapor, though uncaptioned, gives the impression of smoke.

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⑦ Data on existing chronic (annual ambient) sulfur dioxide concentrations in Olympic National Park and in and near Port Angeles are needed in order to determine the baseline concentration of this pollutant and to permit determination of the existing sulfur dioxide-stress to sulfur dioxide-sensitive resources in Olympic National Park.

Baseline data are also needed, for similar reasons, for ozone, particulates, and nitrogen dioxide, all of which are demonstrably injurious to lichens, and for hydrocarbons, which may enter into reactions which alternately affect other air quality related values.

⑧ Page 2-30. "Elwha" is misspelled.

The acreage of Olympic National Park is 908,692.46.

⑨ Page 2-31. Land Use Map should include the headquarters for Olympic National Park and the parkway to Heart O' the Hills.

Dungeness Spit should be labeled and color-coded to reflect its status as a National Wildlife Refuge; "recreational" is not an adequate description.

⑩ Page 2-38. The correct acreage for the total Park is now 908,692.46.

⑪ Page 2-46. The group which has formed to oppose the proposed oil port is not discussed, whereas the group favoring the oil port is discussed and examples of their position and projects given. The final statement should give equal consideration to both groups.

⑫ Pages 3-2 through 3-5. The discussion of $SO_2$ emissions is based on average emissions rather than worst case emissions scenario. Though it is probably valuable to depict averages, it is equally important to depict the worst case. For instance, only the one scenario with 80,000 dwt and 190,000 dwt tankers was used for modeling, when it is possible that as many as three 327,000 dwt ships could be off loading simultaneously. It would be enlightening to match this worst case emission rate with worst case meteorology conditions. Again, it must be pointed out that the Class I increments are averages and may not protect against damage to park resources resulting from air pollution.

⑬ It would be extremely valuable for comparison purposes to have figures for the possible 1,283,000 bpd port capacity throughout this chapter.

⑭ Page 3-2. The statement that there will be a 10 percent increase in annual average sulfur dioxide concentration implies that the existing annual average concentration is known. If so, this information should be included in the statement. If the existing value is in excess of approximately 10 $\mu g/m^3$ within Olympic National Park (as the statement implies), then the possible damage to sensitive lichen species must be addressed.

The possible adverse impacts of port facility construction on air quality in Olympic National Park are not assessed. If there will be none, it should be so stated. The same applies to possible impacts deriving from construction of the storage facility. If prediction is "difficult" as stated, more refined analysis is indicated.

This section does not mention acid rain, the result of sulfur dioxide being released into a moist environment. The probabilities of acid rain forming and discussion of the resultant effects on vegetation, surface and ground waters, and soils should be included in the final statement.

The last paragraph under Summary is contradictory. The National Park Service must have a good understanding of the expected impacts on visibility in Olympic National Park to fulfill its obligations under the Clean Air Act Amendments of 1977.

"Main park boundary" is a meaningless term.

⑮ Page 3-3. Table 3.1.2-4 omits figures for the 933,000 bpd capacity.

⑯ Pages 3-3 and 3-4. Tables 3.1.2-4 and 3.1.2-5 are confusing. It appears that the 709,000 bpd queuing model was used to derive emission rates for the 933,000 bpd level. Is this correct? This procedure should be explained.

⑰ Page 3-4. The paragraph concerning Olympic National Park should include a clear statement that Class I increments for sulfur dioxide will be violated within Olympic National Park.

The statement should explain why the frequency of Class I sulfur dioxide violations is the same at both throughput levels.

A more detailed discussion is also needed to explain why the worst emission scenario was not used. Though probability of occurrence may be low, it would appear that it should be considered since it could occur. This is especially important in the case of visibility impact which is not regulated by increments or on an annual or short-term basis.

"Main park boundary" is a meaningless term.

⑱ Page 3-6. The National Park Service does not necessarily agree that hydrocarbon emissions in excess of standards are tolerable in Olympic National Park. Hydrocarbon concentrations should be modeled so that the possibility of impacts on park ecosystems can be assessed.

The statement that ". . . since hydrocarbons by themselves do not prove to be a health hazard" cannot reasonably be supported.

The environmental statement should report where exactly purging of ship's ballast tanks would occur since proximity would influence hydrocarbon concentrations in the Park.

⑲ Page 3-7. The section on Visibility is totally inadequate. Visibility is one of the most significant values associated with Olympic National Park, and the paragraph discussing it is cursory and ambiguous. The statement that most of the park would be above the haze layer and that ". . . to an observer of other sights within the Park no reduction in visibility would be apparent . . ." fails to take into account the following:

1. There is an observable movement of haze up river valleys such as the Elwha, Little River, Morse Creek and its tributaries, and Siebert Creek.

2. In portions of Olympic National Park which would allegedly be above the haze layer, like Hurricane Ridge, the view of the haze layer would be as undesirable as the view from within the haze layer.

3. Views outside the park are just as important as views within the park. One of the most popular viewing areas in Olympic National Park is Hurricane Ridge. Views from this area are not only within the park but are also toward Port Angeles and across the Strait of Juan de Fuca to Vancouver Island. Another popular view is from the visitor center toward Port Angeles. Views along eight paths over and within the Heart O' the Hills are also popular.

⑳ Page 3-11. Under the heading Geologic Hazards, nothing is said about the effect of alterations of the bluff at Green Point on the dynamic, geohydraulic conditions that maintain the Dungeness Spit. Interference with the process of shoreline drift predictably causes problems in the deposition area. The effect of this alteration on "the largest federal waterfowl refuge in Washington state" (page 2-22) should be considered more fully.

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㉑ Page 3-32. Pinnipeds is misspelled six times. The two paragraphs discussing impacts on sea mammals indicate that seals and sea lions are subject to impact from oil spills. Page 5-7 says that they have been sighted near oil spills, but they do not become contaminated. Which of these contradictory statements of fact is accurate?

㉒ Page 3-38. The photograph with overlaid drawing of the cut in the bluff and the tank farm is very deceptive. Only 11 tanks are shown when 25 may be built. Trees are shown covering the site when 90 percent will be removed. Are the 285-foot diameter tanks rendered to scale?

㉓ Page 3-40. The last paragraph is misleading. First of all, Class I increments, not air quality standards, is the topic of discussion. Secondly, the Class I increments for the potential wilderness are no different than those for the rest of the park. Therefore, the statement should read ". . . the Class I increments for sulfur dioxide in Olympic National Park would be exceeded."

㉔ Page 3-41. The paragraph concerning risk of fire and explosion is unconvincing. First, what is the increased risk with a third berth? Second, what percentage of explosions alone (not combined statistically with fire) result in onshore property damage in excess of $1,000? Third, what percentage of import explosions result in such property damage? Fourth, what percentage results in loss of human life? Fifth, what percentage of explosions specifically in Port Angeles harbor would result in loss of life and property damage? It is very hard to accept an unsupported statement that a Bantry Bay or California type explosion could not occur in Port Angeles, with a resulting loss of life, medical facilities, emergency air transportation (U. S. Coast Guard), etc. Since this potential impact is a major concern due to the perceived effect on Port Angeles, medical facilities, etc., a detailed and documented explanation is needed and should be included in the final statement.

㉕ Page 3-47. Impacts on visitors to Olympic National Park who expect and seek a pristine environment should be discussed in the section on Recreational Resources.

㉖ Page 3-50. More discussion of other petroleum based industry is required. Documentation is needed for the statement that such industry is unlikely.

㉗ Page 3-56. The last sentence of the last paragraph under the summary does not follow from the discussion of impacts on air quality. The summary should briefly relate what the impacts will be—not make a judgment on their importance.

Impacts on air quality are summarized as being negligible. On page 4-2, no mitigating measures are identified; but then, starting on page 5-1, there is a long list of unavoidable adverse impacts on air quality. Apparently, there are impacts, and mitigation should be identified.

㉘ Page 4-2. A discussion of possible mitigating measures to protect air quality over Olympic National Park would be in order here. One such measure is discussed on page 5-1 in the paragraph on low-sulfur bunker fuel. Another measure could be a prohibition on off loading during periods of critical meteorological conditions.

㉙ Page 5-1. There seems to be an erroneous assumption in the section on Air Quality. It must not be assumed that an exception to the allowable Class I PSD requirements is permissable.

㉚ Page 5-6. Under "Operation Phase" it says "Chronic oil spills from tanker off loading could cause subtle changes in organisms and communities . . ." Page 3-28 says, "Spill impacts from acute, short-term exposure to large quantities of oil or chronic long-term exposure to small quantities of oil would result from the chemical (toxicity) or physical (smothering) characteristics of the oil. "Biological impacts would include: 1) adverse effects on human health from eating contaminated seafood, 2) decreased fishery resources, 3) modification of marine ecosystems by the elimination of species which decreases ecosystem diversity and/or productivity, and 4) modification of habitats and delay or prevention of recolonization." Therefore, it would be more correct to say that chronic oil spills from tanker off loading would cause drastic, rather than subtle, changes in organisms and communities.

㉛ The impacts of a three-berth port with the 1,283,000 bpd throughput, third submarine pipeline, and additional tank storage should be considered in the same detail as the 709,000 and 933,000 bpd levels of development. Instead of being buried in the relative obscurity of Chapter 6, this information should be fully described, analyzed, tabulated and charted in Chapters 1, 3, 4, and 5 concurrently with the other two capacities in a form that provides easy comparisons.

㉜ Page 6-1. The first sentence in the lead paragraph raises a confusing point. If the short-term is the 20-year life of the project, how would the project be able to provide a long-term (more than 20-year) supply of crude oil to northern tier and inland states? Also in this paragraph, the impact of the project on Olympic National Park should be mentioned.

㉝ Chapter 7. The entire chapter does not make clear the difference between irreversible and irretrievable. Irreversible would apply to the destruction, elimination, or permanent loss of resources, such as the destruction of Dungeness Spit, the loss of archeological artifacts, the extirpation of a species, etc. Irretrievable applies to the long or short-term commitment of resources during the life of the project but which can be reversed in the future. This distinction is important.

Though changes in air quality in Olympic National Park may not be irreversible, the effects of air pollutants on air quality related values may well be irreversible. Olympic National Park has been designated as a Biosphere Reserve and contains important gene pool resources, the loss of which would be irreversible. Such effects should be evaluated and included in this discussion.

㉞ Chapter 8. The purpose of the applicant is stated in such a manner that it is difficult or impossible for other options to compete on an equal basis. Several of the other options, when taken in combination, seem to fulfill the stated purpose with far less environmental and financial cost and with equal efficiency. Any conclusions drawn from the draft environmental statement must be with the realization that equal or better proposals are available. The draft environmental statement should state this clearly, probably in Chapter 1.

㉟ Page 8-98. Discussions of the Port-Pipeline Alternatives do not include the relative impact on air quality. Several of these alternatives would likely have significantly less overall effect on air quality.

㊱ Alternative systems which follow existing utility and transportation corridors would have minimal environmental impact. The advantages of these alternatives are not adequately discussed. The final statement would benefit from a qualitative comparison of the alternative oil delivery systems in tables similar to those on pages 8-48 and 8-95 to 8-97.

Map Addendum

㊲ Page 15. The Bogachiel drainage, Point of Arches area, and Heart O' the Hills Parkway corridor in Olympic National Park have been omitted from the map. Dungeness National Wildlife Refuge has also been omitted.

㊳ Page 56. Olympic National Park should be included as an existing use.

㊴ Page 59. Park headquarters is incorrectly located on the map titled Nonattainment Area. The two shades of gray should be explained.

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㊵ Pages 60-62. We question the use of a single data base for wind direction and velocity values used in the models. In a more realistic, synoptic case, the 24-hour $SO_2$ "plume" would be expected to exhibit enough curvature (in plan view) to intercept the Heart O' the Hills highway corridor at times.

㊶ Page 68. Olympic National Park should be included.

㊷ Page 136. Visual resources of Olympic National Park should be included.

㊸ Page 74. Projected impacts on visibility should be included.

Technical Document

㊹ Page 107. The exact location of the waiting queue should be given. It may be near enough that emissions from waiting ships will contribute to those from tankers at the unloading facilities and thus increase the production of air pollutants.

The hypothesized random nature of the arrival of tankers is likely to be nonrandom at times like Christmas, New Year's Day, Easter, etc. We recommend that arrivals be recalculated based at least partly on existing tanker traffic at the Puget Sound ports of Cherry Point, Anacortes, and Tacoma. This is important as it relates to the rationale used to disregard "the worst emission scenario," cf., page 3-4 of the statement.

Page 142. The table does not specify how probabilities are converted to frequencies. By our method, the Class I $SO_2$ increment would be exceeded approximately 6 to 8 times per year at park headquarters and approximately 5 to 6 times per year in the Heart O' the Hills corridor 8 km south of the port facility. To what extent does this include annual, 24-hour and 3-hour increment exceedences?

Page 144. It is noted that a worst case (largest tankers) $SO_2$ calculation was made for receptors in Port Angeles over 3-hour and 24-hour periods. Corresponding concentrations in Olympic National Park should be calculated.

Page 155. We note that the TEM model showed "very little difference (in ground level concentrations) depending upon the mixing height." This observation deserves explanation. Is it a weakness of the model that leads to underestimates of ground level concentrations?

Page 168. Fig. 3.4-3 shows exceedance of 3-hour $SO_2$ PSD Class I increment in Olympic National Park. Fig. 3.4-4 shows exceedence of the 24-hour $SO_2$ increment. Greater violations are shown for the 3-berth scenario in figures 3.4-6 and 3.4-7. These exceedences should be discussed in the text.

Pages 168-174. A more detailed discussion of the rationale used for disregarding "the worst emission scenario" results should be included. The National Park Service attaches great significance to the concept of planning for the "worst case."

Pages 182 & 183. The modeled annual average $SO_2$ concentration at park headquarters appears to exceed the Class I PSD increment for both throughput values.

Page 197. The discussion and presentation of Valley Model data in figures 3.6-1 and 3.6-2 are not clear. Concentrations in Olympic National Park should be plotted on a map.

Page 205. The discussion seems to predict a project-caused impairment of visibility in Olympic National Park.

㊺ B. Pacific Northwest Trail, Washington (area under study)

The Pacific Northwest Trail Study has not yet been completed; however, from early identification of alternative routes, it appears that the pipeline route might conflict with the proposed trail in the northeast portion of the Olympic Peninsula. Mitigating measures may be required to ensure that the recreational value of the proposed trail is not diminished by the proposed project.

C. St. Joe Wild and Scenic River, Idaho

The proposed pipeline route appears to cross the St. Joe Wild and Scenic River, which is administered by the Forest Service. Close coordination with this agency should be undertaken to mitigate any adverse impacts on this area of the Wild and Scenic River System.

D. Lewis and Clark National Historic Trail, Montana

The pipeline crosses the trail at Townsend, Montana, and at the crossing of the Missouri River at the border of Montana and North Dakota. Oil spills from a ruptured pipeline are always a possibility anywhere along the route. The applicant has apparently included check valves and block valves in sufficient numbers and in strategic locations and provided for proper cleanup measures so as to minimize and mitigate the effects of such possible spills. Additionally, at the crossings of the national historic trail, the statement identifies the possibility of critical water erosion during construction and potential significant soil compaction and wind erosion, particularly at the Townsend site. Mitigation measures, described for control of such possible erosion, appear adequate.

It appears that BLM lands may be located at these two crossings of the Lewis and Clark Trail and should be considered as components of the trail pending further investigation of the details of the trail's location. The environmental impact statement states that vegetative screening would be provided where the pipeline crosses the trail. Table III.2.14-1 should be revised to indicate that the Lewis and Clark and Continental Divide Trails are no longer pending Presidential approval but have been established.

E. Nez Perce Trail, Montana (area under study)

The pipeline crosses the Nez Perce Trail study area at approximately mile 850 near pumping station 17. The trail is apparently located on private lands in this vicinity, and no particular impacts are noted.

However, should the trail be established and this portion of it be certified as a component, we would recommend that the pumping station be painted earth colors and screened with vegetation to reduce visual impact on trail users.

F. Continental Divide Trail, Montana

The pipeline will cross this Forest Service-administered unit of the National Trails System and measures for mitigating adverse effects are proposed. We recommend close coordination with the Forest Service in ensuring protection of the trail's resources and associated recreational values.

G. Fort Union Trading Post, North Dakota

The pipeline would cross an area approximately 1-1/4 miles northwest of Fort Union Trading Post National Historic Site. This area is identified as one of potential critical water erosion problems. We urge that mitigation measures be carefully implemented in this area to avoid any damage to the national historic site.

H. Other Areas

In our February 12, 1979 letter outlining our general concerns with respect to crude oil transportation alternatives, we listed the following additional areas as located wholly or partially within the counties through which the proposed pipeline corridor passes:

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Mt. Rainier National Park, Washington
Coulee Dam National Recreation Area, Washington
Grant Kohrs Ranch National Historic Site, Montana
Upper Mississippi Wild and Scenic River, Minnesota (under study).

45 In addition, we identified Glacier National Park, Montana, and San Juan Island National Historic Site, Washington, as additional areas located in counties within 25 miles of the counties through which the alignment passes. Based on our detailed review of the Northern Tier draft environmental statement, we do not believe that any of these areas will be adversely affected.

II. ALASKA TO EDMONTON, ALBERTA ALTERNATIVES (FOOTHILLS)

46 The environmental analysis for the two Foothill proposals (described on Page 8-100) which involve the transport of oil to Skagway via tanker, should include a discussion of impacts on Glacier Bay National Monument. The tanker route from Valdez to Skagway would parallel the boundary of Glacier Bay National Monument for roughly 150 miles and would impose significant risks to the marine resources of the monument. In addition, the construction and operation of a terminal facility in Skagway risk potentially significant impacts on the cultural resources of Klondike Gold Rush National Historical Park. A comprehensive analysis of these effects should be included in the final environmental statement.

Enclosure

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COMMENTS ON THE

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PROPOSED CRUDE OIL TRANSPORTATION SYSTEM

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7 March 1979

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## COMMENTS ON NORTHERN TIER DRAFT ENVIRONMENTAL STATEMENT

1. Electrical energy supply impacts are summarized in Table 2.1.1.13-5 and Table 3.1.13-5 (pages 2-36 and 3-46, respectively). If current forecasts hold, Port Angeles City Light is expected to have a firm energy demand about 19 megawatts (Mw) in excess of its firm energy allocation, while Clallam County PUD will experience a shortfall of 7.5 Mw. As stated on page 3-56, even with currently contracted WPPSS power, Port Angeles City Light will fall significantly short (13 Mw) of its forecasted firm power requirements without Northern Tier's load, while Clallam County PUD will have sufficient power if Northern Tier's load is not added but will experience a forecasted defecit if Northern Tier's load is included for 1984-1985. According to Table 3.1.13-3, total incremental Northern Tier loads to Port Angeles City Light and Clallam County PUD are 14.9 average megawatts in 1981 and 20.1 average megawatts in 1985.

On page 2-36 it is stated that there might be shortages in regional power availability based upon critical water year conditions in any year from the present through the 1980's. A critical water year is stated to occur one year in ten. The regional energy outlook is better illustrated in the "Estimated Loads and Resources" section of the 1978 PNUCC West Group Forecast. The probabilities that energy resources will be insufficient to meet firm energy and total energy loads are given in Table 1 for various water years.

TABLE 1

Probability that Energy Resources will be Insufficient to Meet Energy Load, %

| | 1978-79 | 1980-81 | 1984-85 |
|---|---|---|---|
| Firm Energy Load | | | |
| --For year shown | 1.6 | 11.4 | 13.3 |
| --Cumulative, 1978-79 through year shown | 1.6 | 19.8 | 54.0 |
| Total Energy Load | | | |
| --For year shown | 12.9 | 39.2 | 33.9 |
| --Cumulative, 1978-79 through year shown | 12.9 | 59.8 | 91.7 |

CONT

In addition, the energy supply problem in the Port Angeles area is further compounded by the fact that the Crown Zellerbach pulp and paper mill at Port Angeles owns and operates two hydroelectric sites on the Elwha River. The 15 Mw capacity Glines Canyon Dam was built in 1930 and was licensed by the Federal Power Commission for a 50 year period. The license is currently coming up for renewal and intervenors are trying to impose new operating, maintenance, and retrofit requirements as conditions for relicensing. The 12 Mw Elwha Dam (built in 1910) has been declared structurally unsound by the Corps of Engineers. The Fish and Wildlife Service as well as the Elwha Indians have argued that the dam should be removed so that the river can regain its historical salmon productivity (2). Any decrease in energy production from Crown Zellerbach's existing hydroelectric facilities will result in further increases in demand on the local utilities.

In light of the fact that electrical energy shortfalls are a highly probable occurrance during the life of the offloading facility, the applicant should discuss the impacts on air quality that would occur when the facility is forced to operate with an interruptible power supply. If the emergency diesel generator (discussed on page 1-10) is used to supply power to the berthing area it will be a significant source of emissions. In addition, without the electrical booster pumps the tankers will be forced to offload at a reduced rate by means of the ships pumps operating alone. An increase in service time would lead to tanker queuing in the harbor and a higher probability of both berths being occupied. Since the time costs for larger tankers are greater than those for the smaller vessels it seems likely that the larger vessels would be preferentially removed from the queue and thus the probabilities of both berths being occupied with large tankers would greatly increase. The result would be a shift in the cumulative emission distribution function leading to a higher frequency of "worst case" emissions.

Similarly, if the emergency diesel generator was not used, and the tankers were allowed to queue in the harbor during short term periods of power interruption, the result would be an increase in the percentage of time both berths are filled, yielding a different cumulative emissions distribution function and a higher probability of exceeding air quality standards.

A third alternative would be for the local utilities to augment their electrical energy supply through the purchase of higher cost thermal power (if available). If the increased costs due to purchase of the costly thermal output were distributed among all ratepayers, the result would be an increased electric utility bill for all consumers and an effective "subsidization" of the offloading facility.

2. The applicant's selection of a Reid vapor pressure (RVP) of 2.9 psia for Alaskan oil is highly questionable in light of the fact that the Port of Long Beach uses a total vapor pressure (TVP) of 9.6 psia for the summer months and 7.4 psia for the winter months (a worst case assumption) and that Alyeska quotes RVP values between 4.8 and 6.3 psia at Valdez. In chapter 3 of their technical document prepared for the Bureau of Land Management (entitled "Air Quality Impacts," dated October 6, 1978) SAI states that "there is apparently no single Reid vapor pressure or, more generally, any single set of crude oil characteristics that is representative of the North Slope crude oil characteristics as they change with the geological formation." Given this fact, it is inappropriate for the applicant to characterize North Slope crude by its lowest reported RVP.

CONT

3. The National Ambient Air Quality Standard (NAAQS) for photochemical oxidants (expressed as ozone) states that the hourly averaged concentration should not exceed 160ug/m³ (0.08ppm) more than once a year.* Ozone modeling by SAI, however, was performed by assuming constant emissions for the tank farm (in lb. HC/hr) over the summer months (see Table 4.6-2, SAI Technical Document, Chapter 3). These averaged emissions are calculated by evaluating the total standing storage and withdrawal HC emissions over the six summer months and then dividing by the total summer hours. In addition, the standing storage losses during the summer months are evaluated for an averaged annual throughput crude oil RVP of 4.0 psia (derived assuming an RVP of 2.9 psia for North Slope crude). It is obviously not valid to utilize semiannual and annually averaged numbers to evaluate whether or not an hourly standard is exceeded.

Storage tank withdrawal emissions occur only when a tank is drawn down. Standing storage losses are dependent on the true vapor pressure of the oil stored within the tank and vary according to $(P/(14.7-P))^{0.7}$ where P is the true vapor pressure of the crude oil in psia at its average storage temperature.

The foreign crudes generally have RVP's which are much higher than that postulated for North Slope crude.

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*[illegible] been relaxed to 0.12 ppm.

For example:

7% of annual throughput has RVP of 5.7 psia
[illegible] " " " " " " 6.5 "
[illegible] " " " " " " 5.4 "
[illegible] " " " " " " 5.5 "
[illegible] " " " " " " 6.4 "
[illegible] " " " " " " 8.9 "

(From Table 2.1-1, SAI, Chapter 3, Air Quality Impacts).

If the tank farm is loaded with a disproportionate amount of foreign crude, the standing storage hydrocarbon emissions will be significantly increased over that calculated when using annually averaged throughput RVP's. A "worst case" tank farm fill coupled with short term withdrawal emissions should be used in determining if the hourly averaged ozone concentration is exceeded.

4. The ballasting hydrocarbon emissions used in the photochemical modeling are due to an 80,000 DWT and a 190,000 DWT tanker ballasting to 20% while in port. According to Table 2.2-5 (SAI, Chapter 3, Air Quality Impacts), the entire 70,000-30,000 DWT fleet has segregated ballasting capability with the averaged segregated ballast capability being 18% of the dead weight tonnage. Thus, an 80,000 DWT tanker would only emit hydrocarbon vapors when filling the (20-18%) or 2% DWT of the non-segregated ballast tanks. Ballasting duration is thus greatly reduced when compared to a tanker with no segregated ballast. Similarly, 73% of the foreign tanker fleet has segregated ballasting capability with the average segregated ballasting capability being 18% of DWT.

As in comment #3, the use of fleet-averaged data when examining prospective violation of an hourly standard is invalid. Ballasting emissions from two tankers, each with no segregated or permanent ballast capability, should be used in determining if the hourly averaged ozone concentration will be exceeded.

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NOTE: On page 3-7 of the Draft Environmental Statement it is stated that hydrocarbon emissions fro the proposed port facility are those corresponding to two 190,000 DWT tankers ballasting simultaneously. This is not consistant with Table 2.2-5 (SAI, Chapter 3, "Air Quality Impacts," October 6, 1978).

5. On page 1-40 of the Draft Environmental Statement the applicant commits to the mechanical chipping of slash during port and onshore storage facilities construction. The slash would then be used as a mulch in revegetation and restoration of disturbed areas or disposed of in an onsite landfill.

No such commitment is indicated for slash generated during pipeline construction. There are 18,910 total acres within the pipeline right-of-way (page 2-119); 3,510 acres of which are categorized as forest/woodland and 7,480 acres as range and shrubland (page 5-20). If slash generated during pipeline right-of-way clearing is to be burned, air pollution emissions should be evaluated.

6. The tank farm standing storage losses were calculated assuming that the storage tanks were to be painted white (e.g. Kp=0.9 in equation 2.4-1 on page 44 of SAI's Chapter 3, "Air Quality Impacts").

On page 1-41 of the Draft Environmental Statement it is stated that the colors of paint would be used to blend with the surroundings in order to present a pleasing visual appearance. On page 1-56 Northern Tier proposed to investigate the utilization of a citizens group in Clallam County to provide advice on the painting of the onshore storage tanks.

Painting the storage tanks colors other than white will increase the standing storage hydrocarbon emissions. For example, the light gray tanks, Kp=1.0 and the standing storage emissions would be increased by 11% over those for white tanks. The applicant should utilize corrected tank colors in computing standing storage hydrocarbon emissions and when performing photochemical modeling.

7. Venting emissions are briefly discussed on page 3-6 of the Draft Environmental Statement. The DES states that "Venting is a process whereby excess vapors that have built up in an emptied cargo tank, are released to the atmosphere through a valve. However, venting emissions are always substantially lower than ballasting emissions." Venting emissions are not discussed in further detail in the DES. SAI's technical document (Chapter 3, "Air Quality Impacts," October 6, 1978) assumes that venting of the cargo tanks is an operation that is not carried out in the port area except in emergency situations.

Tanker venting or breathing emissions occur following unloading of the crude oil. The quantity of hydrocarbons that escape is a function of windspeed, temperature and pressure fluctuations, hydrocarbon vapor buildup, tanker inerting capability, and the amount of leakage from the cargo tanks to the atmosphere.

For tankers with greater than 20% of DWT segregated ballasting capability, in-port venting hydrocarbon certainly must dominate over ballasting releases as ballasting emissions are zero. In the EPA's Alaskan Oil Disposition Study it is stated that "evaporative venting emissions alone could possibly produce concentrations in excess of the NAAQS for hydrocarbons for relatively short distances under stable conditions." (3).

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The applicant should provide justification for not considering this potentially significant source of hydrocarbon emissions.

8. The Draft Environmental Statement on page 3-8 states that "empirical studies have shown that persons begin to distinguish changes in noise level of approximately 5dBA. Thus, changes in noise level lower than 5dBA might be considered insignificant."

The above statement is very misleading as a noise level of 50 decibels combined with a second noise level of 50 decibels yields 53 decibels: an increase of only 3dB. In other words, a doubling of the sound pressure level results in only a 3dB increase over the original sound pressure level (4). Psychologists have devised experiments to determine what change in noise level is usually noticed. Under laboratory conditions as small a difference as ½dB for a 1,000 Hz tone can be distinguished. Under everyday conditions, a 1dB total change is likely to be the minimum detectable by an average observer. In general, a 1dB total change in level is insignificant and 6dB is usually significant (4). Nighttime noise levels of 55 to 60 dBA at residential locations would (besides exceeding the State of Washington Noise Standard for residential areas of 47dBA) probably result in either "widespread complaints" or "threats of community action" (from Ref. 4, Table 3-8, Public Reactions to Corrected Noise Levels).

9. The following tables in the DES appear to contain errors:

-- Table 2.1.1.15-1 on page 2-38, the vessel activity (average/day) for all vessels is less than that for freighters.

-- Table 2.1.1.13-5 on page 2-36, no dates are given for the forecasted loads. If the forecasts are for 1981 and 1985 (they appear to be); the average and peak loads do not agree with the predictions in Table 3.1.13-3 on page 3-46.

-- Do the electrical power requirements for the marine terminal and pumping stations almost double (from 1092mm kwh to 2160 mm kwh) as indicated in Table 7.11.1-1 on page 7-5 for an increase in throughput from 709,000 to 933,000 bpd?

10. It seems unusual that the maximum and average emission factors for uncleaned ship ballasting are identical (see Table 5-9, page 1-2 of SAI's Technical Document, Chapter 3, Air Quality Impacts).

11. In SAI's Valley model application (see page 194 of SAI's Technical Document, Chapter 3, Air Quality Impacts) the ITT, Peninsula Plywood, and Crown Zellerbach plants were assumed by the modeler to be located at the Ediz Hook off loading facility. The emissions from these emission sources was then added to the ship emissions. It is unclear that this assumption will yield conservative results for all cases as the offloading facility is located further from the elevated terrain than the existing sources. It would be more valid to do an individual run for each source location (each source could be located at the origin of a different grid). The results for the separate runs would be additive at a given receptor location for a given wind direction.

12. On page 3-39 it is stated that "displaced log storage could be accommodated. To do so however, would cause economic," traffic, and air quality impacts." (This statement refers to the possible requirement for dry land storage of the (up to) 34 million board feet of log storage displaced by the berthing facility. On page 3-43, it is further stated that "displacement of log storage in the harbor to land storage would likely increase truck traffic within the city.... Most of the increased truck traffic would enter Port Angeles from the west and would travel to the Crown Zellerbach plant via truck road and Marine Drive. There is not sufficient information available at this time to estimate this volume of increased wood products truck traffic."

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The applicant indicates that air quality impacts would occur due to a significant increase in logging truck traffic in the Port Angeles area. The applicant should assess the degradation in air quality, both due to direct diesel as well as fugitive dust emissions. Impacts that this action may have on SIP proposals should be discussed. Noise and nuisance aspects should also be addressed.

13. The data contained in Table 3.1.2-5 of the Draft Environmental Statement does not correspond with that presented in the cumulative frequency of $SO_2$ and $NO_x$ emissions presented in Figures 3.2-1 and 3.2-3 of the SAI Technical Document (Chapter 3, Air Quality Impacts). In particular, the $NO_x$ emission rates appear to be low by a factor of 2.

14. On page 3-5 of the Draft Environmental Statement the terrain sensitive model Valley is reported to give (with existing emissions added) a maximum $SO_2$ concentration of 4 55 ug/m$^3$ during the simultaneous unloading of 80,000 and 190,000 DWT tankers. Although this event would clearly exceed both the federal as well as the State of Washington standards of 365 ug/m$^3$ and 260 ug/m$^3$, respectively, the event is dismissed as "historical records indicate a probability of this particular concentration occurring less than once every 5 years."

The fact that a particular concentration appears infrequently does not constitute valid grounds for dismissing an occurrance which exceeds air quality standards. The applicant should calculate the frequency of exceeding the applicable standard, in this case, 260 ug/m$^3$. As this standard can obviously be exceeded by tanker combinations with greater probabilities of occurrance than the "worst case" 90 percentile level selected by the applicant, the frequency of violation will be greatly increased.

15. Sulfur dioxide air quality impacts for the 1,059,000 and 1,283,000 bpd throughputs are given on page 6-4 of the Draft Environmental Statement. It is stated that the PSD increments for sulfur dioxide emissions would probably be exceeded for 21 days per year with a throughput of 1,059,000 bpd and 32 days per year at the final throughput of 1,283,000 bpd. The applicant does not specify whether the 3-hour or the 24-hour average increments are being referred to.

Similarly, the applicant states that the Class I standards in the Olympic National Park would likely be exceeded 6 to 7 days per year. It is not clear whether the 3-hour or 24-hour increments are being referred to, or whether this statement refers to the park headquarters or the main park boundary.

It is recommended that the discussion of air quality impacts due to higher throughputs be removed from Chapter 6 of the DES ("Short-Term Uses Versus Long-Term Productivity") and placed in the Air Quality section of Chapter 3 ("Impacts of the Proposal"), and the above-mentioned points are clarified.

16. In further reference to the visibility question, it should be pointed out that the emission of dark particles, such as smoke, from vessels (tugs, tankers, etc.) burning diesel or relatively heavy distillate fuels under early morning conditions of atmospheric stability such as frequently occur in the Port Angeles harbor can be expected to result in significantly visible impairment of air quality in that area. Under these conditions, it will be virtually impossible to see the Olympic Mountains from the harbor area. Conversely, visitors in the park looking down towards Ediz Hook will see only a pall of dark smoke hanging over the harbor. In sum, the esthetic value of the beautiful vistas in this unusually scenic section of the United States will be seriously degraded on frequent occasions during the year.

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We wish to acknowledge the invaluable advice and consultation offered by Professor Franklin Badgley of the Department of Atmospheric Sciences in matters related to meteorology and diffusion modeling.

REFERENCES

1. Pacific Northwest Utilities Confrence Committee, West Group Forecast of Power Loads and Resources, July, 1978-June, 1979, March 1, 1978.

2. Conversation with Orville Campbell, Plant Engineer, Crown Zellerbach Corporation, Port Angeles, February 23, 1978.

3. U.S.E.P.A., Region X, "The Alaskan Oil Disposition Study: Potential Air Quality Impact of a Major Off-Loading Terminal in the Pacific Northwest," March, 1977.

4. A.P.G. Peterson and E.E. Gross, Jr., Handbook of Noise Measurement, General Radio Co., 7th Edition, 1974.

## REVIEW OF IES BY A.P. WAGGONER

Summary: Visual air quality will be slightly degraded; more in area viewed from Olympic National Park than within the park itself. The degree of impact will be a small increment on top of the existing effect of Port Angeles. The modeling of $SO_2$, particle concentration and $O_3$ predicts very small impacts. The models should be viewed with a great deal of caution and accuracy may be no better than factors of 10. Even so, the emissions from the oil transfer facility for all pollutants are apparently much less than urban Port Angeles. Because of the small increment in emissions, changes in all aspects of air quality will probably be small.

### I. Visibility

The current Olympic National Park visibility or visual air quality is probably similar to that in other rural areas surrounding Puget Sound. Figure 1 is the frequency of occurrence distribution of about 30 days of 1/2 hour averages of measured scattering extinction using a nephelometer.

Visual range, V, can be calculated from particle scattering, $b_{sp}$, by

$$V = \frac{3.92}{b_{sp} + 1.5x10^{-5}}$$

Geometric mean visibility is about 50 Km and about 30% of the time visibility is in excess of 100 Km. (Nephelometric measurement of visual air quality in complex terrain is superior to observer visibility because an observer usually will not have suitable visual targets at a range of distances. For an observer to determine a visual range of 100 Km, he needs targets at several distances slightly greater than and less than 100 Km. In complex topography, visual range is difficult to determine due to lack of suitable targets.)

Visual air quality is degraded by materials that absorb or scatter light. $NO_2$ absorbs blue light and particles absorb and scatter light. $NO_2$ concentrations expected from the facility are small enough to have no effect and particle emissions will be much smaller than Port Angeles. The fugitive dust from the construction phase will be predominantely dust from vehicle operations on paved and unpaved roads. These particles are predominantly larger than 5 um, have short lifetime and transport distances and will cause only local visibility reduction.

The fine particles (diameter below 2.5 μm) emitted by fuel combustion or formed from gas to particle reactions starting with $SO_2$ or hydrocarbons are efficient at scattering or absorbing light. These fine particles follow the air motion and have long lifetimes in the atmosphere. The emission and transport modeling of particulate emission associated with oil transfer operations is inadequate in that sources are not characterized by particle size, only by mass of emission. The direct emission of particles from oil transfer operations are predicted to be less than 10% of that of Port Angeles. The emission of $SO_2$ and hydrocarbons by the facility is estimated to be about 30% of Port Angeles.

Assuming the data for the facility and for Port Angeles is correct, the facility will product of order 10% of the visual air quality degradation now produced by Port Angeles for periods other than stable high pressure stagnant conditions. This estimate is made assuming there is an effect proportional to particle mass emissions only. For sunny stagnant high pressure conditions where $SO_2$ and hydrocarbons are converted to particles, the degree of visual impact could be up to 30% of the existing impact of Port Angeles.

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There are now periods, usually during the Fall, when the Puget Sound region is blanketed by haze and the oil facility will contribute slightly to the severity of these hazes. We do not now have data that can define the current impact of Port Angeles that could be used to predict the impact of the oil transfer facility. The year-to-year variability of weather probably would mark this increase in haze.

### II. Reactive Diffusion Modeling

In "Technical Document, Chapter Three", page 224, Ranzieri is quoted as estimating that IMPACT, a diffusion reactive plume model, is accurate to a factor of two. This claim of accuracy is not justified for any model used in application to the Port Angeles facility for the following reasons

#### A. Complex Terrain

The complex terrain model is described in pages B-2-53 to B-2-61. A standard Gaussian plume model is used except that the plume centerline is altered to prevent the plume from impacting an elevated surface. The centerline x-y trajectory is apparently unaltered. Real air motion follows the contour of the land, divides around hills, etc. It is difficult to estimate the magnitude or sign of the error due to inadequate modeling of complex terrains

#### B. Dispersion Coefficients

Diffusion of substance in a Gaussian plume is described by the vertical and horizontal width coefficients $\sigma_y$ and $\sigma_z$. These coefficients are found in tables as a function of downwind distance from the source and as a fulction of meteorological parameters such as vertical temperature distribution, insolation and wind speed. The Port Angeles area is difficult to model in that part of the surface is land and part water and lacks a good meteorological data base. Air above land will be more stable than over water during the winter when land is cold. Air above water will be more stable than above land during the day in summer because the land is heated by the sun.

Vertical stability was estimated using Seattle data. This station probably was that located in Montlake, about 3 Km inland from Puget Sound. Vertical temperature structure on land in summer (the time of probable $O_3$ maximum) will produce much higher mixing and lower concentrations than are likely to occur over water.

#### C. Hydrocarbon Chemistry

Complex multi-chemical reaction models are described that would be suitable for predicting $O_3$ production and concentration. They are not applied here because the hydrocarbon emissions are not separated by degree of reactivity. The data base for both existing air quality and projected facility emissions does not contain enough information on various hydrocarbon species to allow use of adequate models. The models themselves may not be adequate in that they have been developed for California or Eastern U.S. conditions and our site is more rural, has less illumination and has a large sea aerosol component.

#### D. Model Calculations

The model predicted concentrations can be examined from two viewpoints: (1) Is the predicted concentration physically reasonable? (2) Can the model accurately predict background conditions?

Concentration isolines for $SO_2$ are presented on pages 169-174 in the Technical Document, Chapter Three. Presented are 1-, 3- and 24-hour maximum concentrations for $SO_2$. 1- and 24-hour isopleths are reasonable but the 3-hour seems questionable. A series of islands of high concentration probably reflects an instability or error in the model rather than reasonable concentration isopleths.

Box and trajectory models are used to calculate $O_3$ concentration using one hydrocarbon species. In data presented on pages 309-336 in Technical Document, Chapter 3, time versus concentration plots are made of $O_3$ for baseline conditions. The models predict 0.3 to 5 ppb sunrise $O_3$ concentrations linearly increasing to afternoon peaks of 6 to 14 ppb of $O_3$. I have $O_3$ data from a rural site of 3 Km NW of Bellingham during September and October 1977. Two randomly selected days of $O_3$ versus time are shown in Figure 2. On 10-3, sunrise $O_3$ is 5 ppb and $O_3$ reaches 30 ppb in the afternoon. On 10-25-77, $O_3$ is about 30 ppb all day until about 5 PM after which concentration

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decreases to 5 ppb by 11 PM. Predicted background $O_3$ does not seem to agree with my rural Puget Sound data. Measurements are a factor of 2 to 5 higher than predicted background concentrations.

E. Modeling Summary

Calculated concentrations of $SO_2$ and $O_3$ have very large uncertainties, potentially a factor of 5 or even greater, and the models probably underpredict rather than overpredict. Some of this error is due to model limitations such as inadequate treatment of complex terrain and some due to inadequacies of the meteorological and emission data base. The increments of $SO_2$ and $O_3$ will be proportional to the added increments of emission of $SO_2$ and hydrocarbons above that emitted by Port Angeles. This appears to be an increment of 25% and the most probable violation would be Class I $SO_2$ in the Olympic National Park.

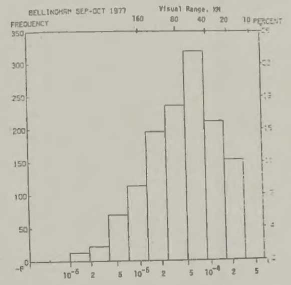
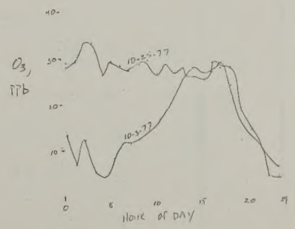


Figure 1 1/2 hour averages for ≈ 30 days.
Measured visual range inferred from nephelometer measurements. Data from rural area 3 KM NE of Bellingham in Sept.-Oct. 1977.

Figure 2 Measured $O_3$ in ppb in rural area 3 KM NW of Bellingham (two randomly selected days)



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## COMMENT ON SAI RESPONSE

by A. P. Waggoner

Pg. 55-56, Visibility

SAI responds that $SO_4^{=}$ and $NO_3^{-}$ will be the most likely substances to reduce visibility and that these materials are slowly produced from gaseous emissions. Particulate carbon (soot) will also reduce visibility and this has not been mentioned by SAI. A large fraction, one-half I would estimate, of the particle mass emitted by tankers and tugs will be soot and this material is very efficient at reducing visibility. Soot particles of 0.1 μm are about three times as efficient at reducing visibility as $SO_4^{=}$.

Pg. 57-68 and Appendix, Ozone

SAI responded that photochemical modeling contains many unknowns concerning emissions of specific hydrocarbon species and accuracy of the chemistry contained in the model. SAI concludes that the model is more suitable for predicting the relative change in ozone levels before and after the construction of a new facility. This is a reasonable conclusion and represents a retreat from the claim of factor of 2 accuracy made in the technical document.

Additional Visibility Effects

During unloading, tanker engines will be operated to pump oil. The emissions will be hot (400°C) and have a velocity of order 4 m/s. The plume will rise to approximately 500' under stable conditions and spread downwind and crosswind. This will, under stable low-wind conditions, produce a haze layer visible both from the Olympic National Park and from Port Angeles. Under these conditions, this visible haze layer will be detached from the urban haze of Port Angeles because of its elevation. The haze, by its separation, can be a visible degradation of the environment even if the emissions of the facility are a small fraction of those of Port Angeles.

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April 11, 1979

Ron Marlenee
U. S. House
Washington D.C. 20515

Dear Mr. Marlenee,

We strongly oppose the proposed Northern Tier 2 Mile Energy Corridor. In specific, the area covering the Nine Mile and Frenchtown area consists of 2/3 private land. Northern Tier would have the power of eminent domain leaving us tax payers no rights once their plan is granted.

Other serious problems which deeply concern us are:

Watershed problem - This pipeline would cross 21 tributaries of Nine Mile Creek plus Six Mile Creek, losing our sources of water.

Hydrostatic tests would deplete these creeks for a time and cleaning agents used would be returned destroying all life.

Inspection and quality control would be inadequate for 1 man to cover such vast areas.

Leak detection is too inadequate. As much as 148,650 gals. could leak without being detected.

Road damage would be too great. Our present roads could not handle the equipment. Tax payers would have to pay for these repair costs. At present County and State have limited funds and not enough men.

Our property values would go down and our taxes would continue to rise to cover road and environmental destruction.

As our elected representative we consider it your responsibility to your constituents of the State of Montana to prevent the destruction of this beautiful valley by refusing this proposal which is solely motivated by profits.

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Sincerely,

Mr. & Mrs. Norman Meltner

Mr. & Mrs. Norman Meltner
6 Mile Road
Huson, Montana 59846

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Dale A. Gunderson
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Phone: 827-4435
March 31, 1979

Bureau of Land Management
Northern Tier Project
Room 1330, Lloyd Building
700 N.E. Multnomah
Portland, Ore. 97232

Dear People:

Upon reviewing the draft Environmental Impact Statement (EIS) prepared by your office, I have found it inadequate in several areas:

(1) Concerning stream and river crossings-
How will all this heavy equipment get across rivers and streams? Will bridges be built? What additional impacts will this have on the stream or river, and to its fish and wildlife.

(2) Regarding energy resources to operate the pump stations-
The Northern Tier Pipeline (NTP) would consume nearly six million KWH of electrical power per day. Montana will no doubt have to supply part of this power. What impacts will this have on Montana's power resources? It could cause increased strip mining of coal and associated thermal generation impacts in eastern Montana.

(3) Social Impacts to Montana-
Life styles in Montana and the impacts the pipeline will have during and after construction, in terms of attitudes the people will have. This was not addressed to specific areas that would be affected by the pipeline.

(4) Regarding discharge of water-
Upon completion of pipelines, they are required to be filled with water in order to check for leaks. Where will this water come from? And when discharged from the pipeline, will it go back into the stream as dirty (rusty, oily) water? This will cause impacts on aquatic insects, fish and wildlife. Also erosion problems may occur when that much water is discharged at great pressures onto dry land.

(5) Minor oil spills during construction-
These spills generally occur when equipment maintenance is needed. The procedure (from what I have seen) is to change the oil where ever the equipment is and to dump the oil on the ground. It may seem like a small amount but these amounts add up. These impacts were not addressed.

(6) Concerning Inspections of the pipeline-
What kind of inspections will be made, during and after construction? The Alaskan Pipeline seems to have had many regulations and engineering inspections, but still there were many things that went wrong, three major oil spills before the pipeline reached Valdez, a major blow-up, the demise of stream habitat, and erosion problems, these are only a few problems. How will these problems be dealt with in the field during construction? Extensive inspections must be made to eliminate these problems.

(7) Need for the oil
The assessment of the national need for Alaskan crude oil and its useability on the west coast was ignored in the EIS.
Montana presently exports 2/3 of the crude oil produced in the state. What are alternatives to this situation? Could there be a redistribution of this supply to Montana refineries?

It seems as though this impact statement was not adequate in many areas. A project impacting so much land, its people, its wildlife, and its vegitation should evaluate its impacts accurately. It is essential that we spend more time and careful thought about what we are doing to the land and its inhabitants.

Thank you for your consideration concerning the comments in your final EIS.

Sincerely yours,
Dale and Candi Gunderson
Dale and Candi Gunderson

cc: President Jimmy Carter
Secretary of Interior, Cecil Andrus
Senator Max Baucus
Senator John Melcher
Congressman Pat Williams
Congressman Ron Marlenee

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**L-50**

[illegible]

[illegible]ington, D.C. [illegible]

Dear Congressman [illegible],

[illegible] Northern Tier Pipeline [illegible] proposal for this area [illegible]

[illegible]

[illegible] places are left where people at any time of the year, can hike, fish, or just sit and see wildlife: deer, elk, bear, bobcat, bald eagle, osprey, heron, mink, otter, [illegible] I could go on and on listing the different species of wildlife and waterfowl. This [illegible] breeding and nesting grounds for each species of wildlife. To watch these animals struggle against nature alone can be devastating.

This issue definitely concerns me as I observe over 40 trumpeter swans and over a thousand [illegible] on the very ground and water the [illegible] proposed route [illegible] What will be left for our fellow citizens and generations to follow?

[illegible]

[illegible]

Sincerely,

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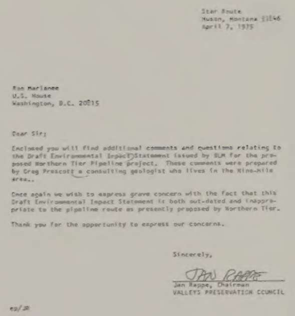
**L-51**

[illegible]
Huson, Mont
59846
April 10, 1979

Rep Ron Marlenee,

Having recently read of so many oil spills and leaks into our beautiful streams and rivers I can't help but be concerned over the proposed Northern Tier pipeline. I would certainly hate to see our beautiful creeks and rivers in the Nine Mile, Six Mile area, and especially our beautiful and historic Clark Fork river filled with poisoning oil. The Northern Tier pipeline could possible, and probably would have oil spills and leaks. We cannot afford to take a chance on ruining forever what is and should be our children's and heritage. The pipeline must be stopped.

L-52



Star Route
Huson, Montana 59846
April 7, 1979

Ron Marlenee
U.S. House
Washington, D.C. 20515

Dear Sir:

Enclosed you will find additional comments and questions relating to the Draft Environmental Impact Statement issued by BLM for the proposed Northern Tier Pipeline project. These comments were prepared by Greg Prescott a consulting geologist who lives in the Nine-Mile area.

Once again we wish to express grave concern with the fact that this Draft Environmental Impact Statement is both out-dated and inappropriate to the pipeline route as presently proposed by Northern Tier.

Thank you for the opportunity to express our concerns.

Sincerely,

JAN RAPPE

Jan Rappe, Chairman
VALLEYS PRESERVATION COUNCIL

ep/jr

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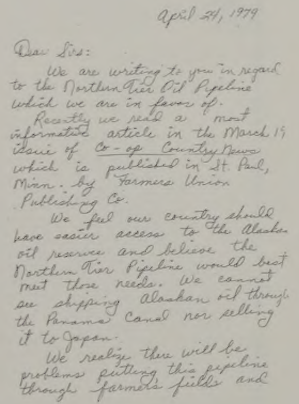
L-53



April 24, 1979

Dear Sirs:

We are writing to you in regard to the Northern Tier Oil Pipeline which we are in favor of.

Recently we read a most informative article in the March 19 issue of Co-op Country News which is published in St. Paul, Minn. by Farmers Union Publishing Co.

We feel our country should have easier access to the Alaskan oil reserves and believe the Northern Tier Pipeline would best meet those needs. We cannot see shipping Alaskan oil through the Panama Canal nor selling it to Japan.

We realize there will be problems putting this pipeline through farmer's fields and

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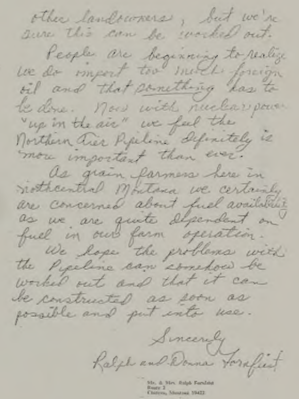

other landowners, but we're sure this can be worked out.

People are beginning to realize we do import too much foreign oil and that something has to be done. Now with nuclear power "up in the air" we feel the Northern Tier Pipeline definitely is more important than ever.

As grain farmers here in northcentral Montana we certainly are concerned about fuel availability as we are quite dependent on fuel in our farm operation.

We hope the problems with the Pipeline can somehow be worked out and that it can be constructed as soon as possible and put into use.

Sincerely
Ralph and Donna Forsfeldt

Mr. & Mrs. Ralph Forsfeldt
Route 2
Choteau, Montana 59422

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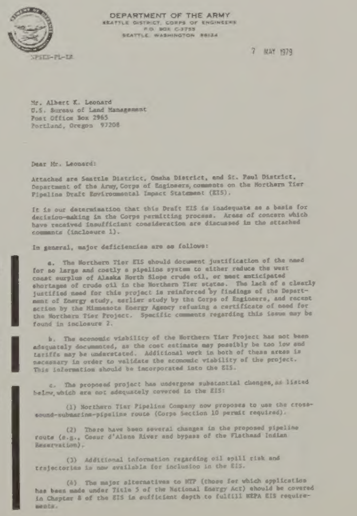
L-54



DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

NPSEN-PL-ER

7 MAY 1979

Mr. Albert K. Leonard
U.S. Bureau of Land Management
Post Office Box 2965
Portland, Oregon 97208

Dear Mr. Leonard:

Attached are Seattle District, Omaha District, and St. Paul District, Department of the Army, Corps of Engineers, comments on the Northern Tier Pipeline Draft Environmental Impact Statement (EIS).

It is our determination that this Draft EIS is inadequate as a basis for decision-making in the Corps permitting process. Areas of concern which have received insufficient consideration are discussed in the attached comments (inclosure 1).

In general, major deficiencies are as follows:

① a. The Northern Tier EIS should document justification of the need for so large and costly a pipeline system to either reduce the west coast surplus of Alaska North Slope crude oil, or meet anticipated shortages of crude oil in the Northern Tier states. The lack of a clearly justified need for this project is reinforced by findings of the Department of Energy study, earlier study by the Corps of Engineers, and recent action by the Minnesota Energy Agency refusing a certificate of need for the Northern Tier Project. Specific comments regarding this issue may be found in inclosure 2.

② b. The economic viability of the Northern Tier Project has not been adequately documented, as the cost estimate may possibly be too low and tariffs may be understated. Additional work in both of these areas is necessary in order to validate the economic viability of the project. This information should be incorporated into the EIS.

③ c. The proposed project has undergone substantial changes, as listed below, which are not adequately covered in the EIS:

(1) Northern Tier Pipeline Company now proposes to use the cross-sound-submarine-pipeline route (Corps Section 10 permit required).

(2) There have been several changes in the proposed pipeline route (e.g., Coeur d'Alene River and bypass of the Flathead Indian Reservation).

(3) Additional information regarding oil spill risk and trajectories is now available for inclusion in the EIS.

(4) The major alternatives to NTP (those for which application has been made under Title 5 of the National Energy Act) should be covered in Chapter 8 of the EIS in sufficient depth to fulfill NEPA EIS requirements.

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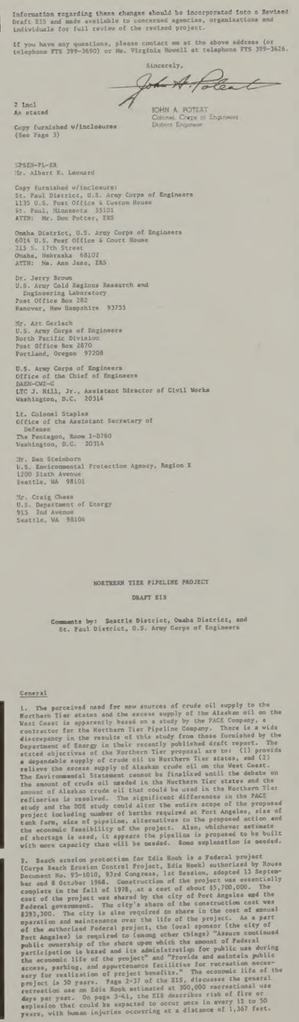

③ Information regarding these changes should be incorporated into a Revised Draft EIS and made available to concerned agencies, organizations and individuals for full review of the revised project.

If you have any questions, please contact me at the above address (or telephone FTS 399-3690) or Ms. Virginia Howell at telephone FTS 399-3626.

Sincerely,

John A. Poteat

2 Incl
As stated

Copy furnished w/inclosures
(See Page 3)

JOHN A. POTEAT
Colonel, Corps of Engineers
District Engineer

NPSEN-PL-ER
Mr. Albert K. Leonard

Copy furnished w/inclosure:

St. Paul District, U.S. Army Corps of Engineers
1135 U.S. Post Office & Custom House
St. Paul, Minnesota 55101
ATTN: Mr. Don Potter, ERS

Omaha District, U.S. Army Corps of Engineers
6014 U.S. Post Office & Court House
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ATTN: Ms. Ann Jass, ERS

Dr. Jerry Brown
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North Pacific Division
Post Office Box 2870
Portland, Oregon 97208

U.S. Army Corps of Engineers
Office of the Chief of Engineers
DAEN-CWZ-C
LTC J. Hill, Jr., Assistant Director of Civil Works
Washington, D.C. 20314

Lt. Colonel Staples
Office of the Assistant Secretary of
Defense
The Pentagon, Room 1-D760
Washington, D.C. 20314

Mr. Dan Steinborn
U.S. Environmental Protection Agency, Region X
1200 Sixth Avenue
Seattle, WA 98101

Mr. Craig Chase
U.S. Department of Energy
915 2nd Avenue
Seattle, WA 98104

NORTHERN TIER PIPELINE PROJECT

DRAFT EIS

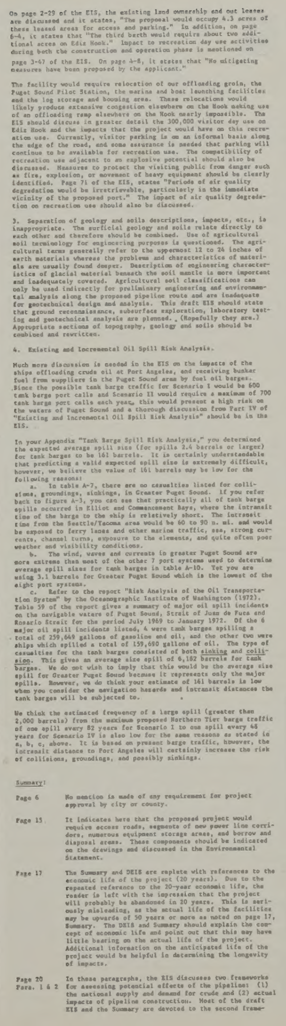
Comments by: Seattle District, Omaha District, and
St. Paul District, U.S. Army Corps of Engineers

General

④ 1. The perceived need for new sources of crude oil supply to the Northern Tier states and the excess supply of the Alaskan oil on the West Coast is apparently based on a study by the PACE Company, a contractor for the Northern Tier Pipeline Company. There is a wide discrepancy in the results of this study from those furnished by the Department of Energy in their recently published draft report. The stated objectives of the Northern Tier proposal are to: (1) provide a dependable supply of crude oil to Northern Tier states, and (2) relieve the excess supply of Alaskan crude oil on the West Coast. The Environmental Statement cannot be finalized until the debate on the amount of crude oil needed in the Northern Tier states and the amount of Alaskan crude oil that could be used in the Northern Tier refineries is resolved. The significant differences in the PACE study and the DOE study could alter the entire scope of the proposed project including number of berths required at Port Angeles, size of tank farm, size of pipeline, alternatives to the proposed action and the economic feasibility of the project. Also, whichever estimate of shortage is used, it appears the pipeline is proposed to be built with more capacity than will be needed. Some explanation is needed.

⑤ 2. Beach erosion protection for Ediz Hook is a Federal project (Corps Beach Erosion Control Project, Ediz Hook) authorized by House Document No. 93-1010, 93rd Congress, 1st Session, adopted 13 September and 8 October 1968. Construction of the project was essentially complete in the fall of 1978, at a cost of about $5,700,000. The cost of the project was shared by the city of Port Angeles and the Federal government. The city's share of the construction cost was $393,300. The city is also required to share in the cost of annual operation and maintenance over the life of the project. As a part of the authorized Federal project, the local sponsor (the city of Port Angeles) is required to (among other things) "Assure continued public ownership of the shore upon which the amount of Federal participation is based and its administration for public use during the economic life of the project" and "Provide and maintain public access, parking, and appurtenance facilities for recreation necessary for realization of project benefits." The economic life of the project is 50 years. Page 2-37 of the EIS, discusses the general recreation use on Ediz Hook estimated at 300,000 recreational use days per year. On page 3-41, the EIS describes risk of fire or explosion that could be expected to occur once in every 12 to 50 years, with human injuries occurring at a distance of 1,367 feet.

CONT



⑤ On page 2-29 of the EIS, the existing land ownership and out leases are discussed and it states, "The proposal would occupy 4.3 acres of these leased areas for access and parking." In addition, on page 6-4, it states that "The third berth would require about two additional acres on Ediz Hook." Impact to recreation day use activities during both the construction and operation phase is mentioned on page 3-67 of the EIS. On page 4-8, it states that "No mitigating measures have been proposed by the applicant."

The facility would require relocation of our offloading groin, the Puget Sound Pilot Station, the marina and boat launching facilities and the log storage and booming area. These relocations would likely produce extensive congestion elsewhere on the Hook making use of an offloading ramp elsewhere on the Hook nearly impossible. The EIS should discuss in greater detail the 300,000 visitor day use on Ediz Hook and the impacts that the project would have on this recreation use. Currently, visitor parking is on an informal basis along the edge of the road, and some assurance is needed that parking will continue to be available for recreation use. The compatibility of recreation use adjacent to an explosive potential should also be discussed. Measures to protect the visiting public from danger such as fire, explosion, or movement of heavy equipment should be clearly identified. Page 71 of the EIS, states "Periods of air quality degradation would be irretrievable, particularly in the immediate vicinity of the proposed port." The impact of air quality degradation on recreation use should also be discussed.

⑥ 3. Separation of geology and soils descriptions, impacts, etc., is inappropriate. The surficial geology and soils relate directly to each other and therefore should be combined. Use of agricultural soil terminology for engineering purposes is questioned. The agricultural terms generally refer to the uppermost 12 to 24 inches of earth materials whereas the problems and characteristics of materials are usually found deeper. Description of engineering characteristics of glacial material beneath the soil mantle is more important and inadequately covered. Agricultural soil classifications can only be used indirectly for preliminary engineering and environmental analysis along the proposed pipeline route and are inadequate for geotechnical design and analysis. This draft EIS should state that ground reconnaissance, subsurface exploration, laboratory testing and geotechnical analysis are planned. (Hopefully they are.) Appropriate sections of topography, geology and soils should be combined and rewritten.

⑦ 4. Existing and Incremental Oil Spill Risk Analysis.

Much more discussion is needed in the EIS on the impacts of the ships offloading crude oil at Port Angeles, and receiving bunker fuel from suppliers in the Puget Sound area by fuel oil barges. Since the possible tank barge traffic for Scenario I would be 600 tank barge port calls and Scenario II would require a maximum of 700 tank barge port calls each year, this would present a high risk on the waters of Puget Sound and a thorough discussion from Part IV of "Existing and Incremental Oil Spill Risk Analysis" should be in the EIS.

In your Appendix "Tank Barge Spill Risk Analysis," you determined the expected average spill size (for spills 2.4 barrels or larger) for tank barges to be 161 barrels. It is certainly understandable that predicting a valid expected spill size is extremely difficult, however, we believe the value of 161 barrels may be low for the following reasons:

a. In table A-7, there are no casualties listed for collisions, groundings, sinkings, in Greater Puget Sound. If you refer back to figure A-3, you can see that practically all of tank barge spills occurred in Elliot and Commencement Bays, where the intransit time of the barge to the ship is relatively short. The intransit time from the Seattle/Tacoma area would be 60 to 90 n. mi. and would be exposed to ferry lanes and other marine traffic, sea, strong currents, channel turns, exposure to the elements, and quite often poor weather and visibility conditions.

b. The wind, waves and currents in greater Puget Sound are more extreme than most of the other 7 port systems used to determine average spill sizes for tank barges in table A-10. Yet you are using 3.1 barrels for Greater Puget Sound which is the lowest of the eight port systems.

c. Refer to the report "Risk Analysis of the Oil Transportation System" by the Oceanographic Institute of Washington (1972). Table 59 of the report gives a summary of major oil spill incidents on the navigable waters of Puget Sound, Strait of Juan de Fuca and Rosario Strait for the period July 1969 to January 1972. Of the 6 major oil spill incidents listed, 4 were tank barges spilling a total of 259,649 gallons of gasoline and oil, and the other two were ships which spilled a total of 159,690 gallons of oil. The type of casualties for the tank barges consisted of both sinking and collision. This gives an average size spill of 6,182 barrels for tank barges. We do not wish to imply that this would be the average size spill for Greater Puget Sound because it represents only the major spills. However, we do think your estimate of 161 barrels is low when you consider the navigation hazards and intransit distances the tank barges will be subjected to.

We think the estimated frequency of a large spill (greater than 2,000 barrels) from the maximum proposed Northern Tier barge traffic of one spill every 82 years for Scenario I to one spill every 48 years for Scenario IV is also low for the same reasons as stated in a, b, c, above. It is based on present barge traffic, however, the intransit distance to Port Angeles will certainly increase the risk of collisions, groundings, and possibly sinkings.

Summary:

⑧

| | |
|---|---|
| Page 6 | No mention is made of any requirement for project approval by city or county. |
| Page 15 | It indicates here that the proposed project would require access roads, segments of new power line corridors, numerous equipment storage areas, and borrow and disposal areas. These components should be indicated on the drawings and discussed in the Environmental Statement. |
| Page 17 | The Summary and DEIS are replete with references to the economic life of the project (20 years). Due to the repeated reference to the 20-year economic life, the reader is left with the impression that the project will probably be abandoned in 20 years. This is seriously misleading, as the actual life of the facilities may be upwards of 50 years or more as noted on page 17, Summary. The DEIS and Summary should explain the concept of economic life and point out that this may have little bearing on the actual life of the project. Additional information on the anticipated life of the project would be helpful in determining the longevity of impacts. |
| Page 20<br>Para. 1 & 2 | In these paragraphs, the EIS discusses two frameworks for assessing potential effects of the pipeline: (1) the national supply and demand for crude and (2) actual impacts of pipeline construction. Most of the draft EIS and the Summary are devoted to the second frame- |

L-54 CONT

work, whereas the justification for building a pipeline lies in the first framework. The summary and EIS should contain more information on the magnitude of crude shortages in those areas supplied by the pipeline, and the economic consequences of not meeting this demand.

⑧ Page 29 — No mention is made regarding disposition of waste material from the cut at Green Point. As this is a major feature, it should be included in the summary.

Natural littoral drift would not be affected as long as sea cliff retreat was permitted to continue. In such case, no real danger to the natural maintenance of Dungeness Spit would be anticipated. If sea cliff retreat were impeded by revetting of the beach adjacent to Green Point, some influence on Dungeness might be observed.

Solution to power requirements should be found before proceeding as this could have significant impacts on other areas.

Page 30 — The Summary Report states that ". . . fires would not be expected during the lifetime of the project. . . ." However, page 3-41 of the EIS states ". . . The incidence of fire is estimated at 1 every 32 years. . . ." Accordingly, there is considerable chance of fire during any one year. This should be clarified.

Page 33 — The report states that the impacts of stream crossings could be minimized by construction during low flows. Will this be done? If not, the impacts should be stated as they are anticipated to occur, not what they might be under ideal circumstances.

Page 34 — The report states that water from streams will be used for hydrostatic testing of the pipeline and then discharged back to the streams. What is the nature of the chemical contaminants which may be introduced during testing? What will their effects be on the streams, and what measures are planned to mitigate any potentially adverse effects? Short mention of this should be made here.

Page 64 — The report displays a graphic representation of the various pipelines. A Williams pipeline, originating in Eldorado, Kansas, and proceeding north through Iowa and Minnesota, is shown. Not shown within the State of Nebraska and proceeding north to South Dakota is another Williams pipeline with a pump station located in Omaha. Is this latter pipeline a viable part of the servicing network, and are there other pipelines not shown?

⑨ Page 1-1, Sec. 1.1, Para. 2 — Provide the names of the independent companies which constitute the Northern Tier Pipeline Company.

Page 1-4, Sec. 1.2, Para. 4 — Table showing curtailment of Canadian oil exports, reaching 0 bpd by 1982 disagrees with text on page 1 of Summary which says Canada intends to maintain exports to the United States at 55,000 bpd until 1982.

Page 1-4, Sec. 1.2, Para. 8 — There is insufficient documentation of the need for a pipeline. Estimates of shortages are quoted, the sources being two oil companies who ironically do not support NTPC, but there is no comparison of supply and demand figures for the marketing area supplied by the pipeline. The national figures shown in tables 1.2-2 and 1.2-3 are irrelevant to supporting the regional need for a pipeline.

This same comment was made on the preliminary draft, but the inadequacy of documenting the need for the pipeline still exists.

Page 1-5, Sec. 1.3 — Portion for Department of Army, Corps of Engineers should read as follows:

Table 1.3-1

| Activity Requiring | Remarks | Remarks |
|---|---|---|
| Construction of Marine Terminal | Permit | Issues permits for work in navigable waters of the U.S. and for discharge of dredged or fill material into waters of the U.S. (terminal facilities and pipeline in Strait of Juan de Fuca, Port Angeles Harbor, and pipeline crossings of streams, lakes and adjacent wetlands. |
| Pipeline Construction | Permit and easements | |

Page 1-8, Sec. 1.4, Fig. 1.4-2 — This figure should be drawn to scale and show existing adjacent facilities, more detail of proposed facilities, deployment of oil spill boom, label displacement or relocation of existing facilities, i.e., marina, pilot station, etc.

Page 1-13, Sec. 1.4, Fig. 1.4-3 — This figure should show how effluent from oil-water separator will be discharged into Siebert Creek.

Page 1-16 — Second paragraph under Pipeline System - This paragraph indicates the pipeline is 1557 miles long. Table 1.4-5, page 1-19, indicates 1560.7 miles long. Table 1.4-19, page 1-42, indicates 1559 miles long.

Page 1-18, Para. 5 — Correct the description of the pipeline route and river crossings.

Page 1-24, Para. 2 — This paragraph does not indicate the type of pipe coating. Allowance for pipe coating in January 1977 estimate was minimal. Type of coating should be indicated.

Page 1-24 — Pump Stations - Paragraph indicates 23 pump stations required for ultimate system and 19 pump stations and 1 pressure reducing station for initial system. From table 1.4-14 it appears 20 pump stations are required initially.

Page 1-31 — The construction or upgrading of access roads to pump stations to insure access under all weather conditions would have severe impacts on terrestrial habitat and wildlife. Depending on topography, such road construction could have severe impacts far removed from the pipeline corridor. In heavy snow zones, would these

CONT ⑨

roads be plowed to permit access on a regular basis since regular biweekly inspection of the pipeline would be done aerially?

Page 1-45, Fig. 1.4-12 — Unclear meaning of note about rock depth in backfill material.

Page 1-45, Fig. 1.4-13 — Forty-eight inch clearance under certain rivers may not be adequate depending on time of year work is done and characteristics of the stream.

Page 1-50 — Detailed on-the-ground inspection of navigable and non-navigable waterway crossings should be required more frequently than at 5-year intervals. Annual streamside and/or underwater inspections would be more appropriate to ward off potential pipeline ruptures and to locate small leaks below detection limits which would not be discovered by biweekly aerial inspection. In addition, all water crossings should be ground checked following any major flood, runoff, or seismic disturbance.

Page 1-51, Table 1.4-22 — Two numbers are in error in this table. 44,404 should be 49,604 and 62,332 should be 821,338 (see tables 1.4-23 and 1.4-24).

Page 1-51 — General Note - The initial phase construction cost has increased from the January 1977 estimate of $949,142,000 by 21.4 percent to the May 1978 estimate of $1,152,131,000. If a more recent cost estimate exists (since May 1978), it should be used.

Page 1-54 — Contingency plans must be developed and approved before construction, not prior to beginning operation. This should be part of designing the system rather than using contingency plans as remedial action to correct design or operational flaws.

Page 1-55 — Oil Spill Contingency Plan - The general discussion of this plan appears to be idealistic, and the plan itself inadequate. The plan is discussed from a best-case attitude and does not discuss impacts resulting from a spill under severe conditions:

(a) It is unreasonable to assume that "one or more" employees could initially begin to contain a spill from a system of this capacity.

(b) Under severe weather conditions (winter) and remote location (e.g., mountainous areas or open plains), it is unreasonable to assume that heavy equipment suitable for building earthen dams, etc., could reach any spill site within 6 hours.

(c) How would spills at water crossings be contained during winter months with an ice cover?

(d) A time lapse of 1 to 6 hours is indicated between detection of a spill and the presence of a recovery cleanup crew. What damage could be done within this time frame? What would be done to mitigate the damage?

Page 1-56 — Much of the pipeline crosses fragile rangeland and plains. Are continuous access roads to be provided adjacent to the pipeline? If paths and roads are built, does the possibility of erosion due to vehicular use arise? What impacts will these roads have on sedimentation and esthetics? If roads are not built, will repair equipment and crews be brought in by air, and if so, what provisions have been made for landing?

Page 1-57 — No. 8 - This step should also include a survey of previously undisturbed portions of right-of-way to identify unnoted environmentally sensitive areas. Such a survey at this stage would allow modifications in alinement, if necessary and possible, to avoid sensitive areas and to provide maximum mitigative measures, if appropriate.

Page 1-58, Item 25-26 — Since the impacts, social and economic, on localities are precipitated by pipeline construction, it is questionable that localities or political subdivisions not benefiting from taxes on North Tier facilities should assume the burden of loans or grants, even with administrative aid from the NTPC. The NTPC is a transient whose stay in a construction area varies. Are the impacts to be mitigated by NTPC?

Page 1-60 — Reduced accretion on Ediz Hook was not due only to building dams on the Elwha River but also to reduction of sea cliff erosion crest of the Hook by riprap placement along an industrial waterline on the beach at the toe of the sea cliffs. Erosion control project includes beach nourishment as well as the rock revetment.

No mention is made of the Coast Guard Station on Ediz Hook.

Chapter 2:

⑩ Page 2-10 — Topography - Terraces are glacial not marine. Map III-2 does not depict the topography as there are no contours shown.

Physical Geology - Olympic Mountains are not a northward trending homocline. Physical geology description mentions what appears to be material at the bottom of the harbor, but does not adequately treat the materials at Green Point. Glacial deposits at Green Point and littoral marine deposits at Ediz Hook are very thick and nowhere are a few inches thick as described. Description should be appropriately rewritten.

⑪ Page 2-11 — Seismicity - Reference to "map section VI" should be changed to "section IV."

Slope Instability - The sea cliff areas in the vicinity of Green Point all are under active erosion and are therefore "unstable" provided that marine erosion is not reduced. Landsliding is but one method of slope retreat. The disagreement over stability or instability is a function of definition. This is later said under soils on page 2-12.

Reference is made to Shannon and Wilson, 1978, but is not listed in reference chapter of DEIS.

Slope instability, outburst flooding, and seismic disturbance are mentioned as threats to the integrity of the pipeline. The EIS should elaborate on the degree of stress that the pipeline would be able to withstand from such occurrences.

⑫ Page 2-12, Table 2.1.1.4-3 — Descriptions of human sensing of earthquake motions pertain to the epicentral area which in itself varies with magnitude. A note should be included to clarify this.

⑬ Page 2-13 — Ground Water - No mention is made regarding surface water or ground water on Ediz Hook. Should be included.

Page 2-13, Figure 2.1.1.4-1 — What is the significance of the dark globe? Should be explained by more than just figure title.

⑭ Page 2-50 — Description or route through Pacific Border Province is mostly erroneous and should be redone. Far too simplified for the complex terrain traversed.

Reference to the channeled scablands under Columbia Plateau Province is erroneous. The route is not entirely within the scablands. Locally the alinement would cross scabland areas, but much of the time will be on meltwater deposits or windblown silt. East of Sprague the alinement does cross an extensive scabland area.

Page 2-52 — Pacific Border Province - Olympic Mountains are not a homoclinal mountainous uplift.

Cascade-Sierra Province - The statement that very little bedrock is exposed is erroneous. Probably mean that the alinement will be sited to avoid bedrock insofar as possible, staying in alluvium, colluvium and glacial deposits.

Use of the term "Interior Lowlands" is inappropriate as the Great Plains are a separate province from the Interior Lowlands.

⑮ Page 2-53 — With recent interest for coal production for energy, what is the proposal for the access and utilization of coal-laden lands which are bisected by the pipeline?

⑯ Pages 2-54 through 2-56 — A better effort should be made to relate soils to geology in this section. Emphasis appears to be on the most surficial part of the soil column and its agricultural capability which, while important in terms of revegetation, corrosiveness and erodability, does not always relate to other important characteristics. Much of the discussion is too generalized though some is quite specific. Subject treatment is not consistent and some statements yield an erroneous impression of ground conditions.

⑰ Page 2-58, Table 2.1.2.6-2 — The Yakima River and the Wanapum Reservoir of the Columbia River should be added to the table. The 100 Year Flow, Maximum Width is not consistent with sponsor's permit application filed with the Seattle District. For example, the permit application shows the Ordinary High Water for the Skokomish River as 838 feet wide but the table shows the 100 Year Flow, Maximum Width of 300 feet. The sponsor should insure survey data consistent as reported to BLM and Corps of Engineers.

⑱ Page 2-60 — No detailed methodology has been given on stream crossing and what the cumulative impact will be on a stream(s) crossed numerous times in a relatively short distance.

⑲ Page 2-68 — Flathead River crossing of pipeline - Physical conditions are not discussed in sufficient detail as other major river crossings are.

⑳ Page 2-90, Table 2.1.2.8-1 — The ecoregion mentioned for the proposed pipeline crossing in Minnesota should not include eastern hemlock.

㉑ Page 1-125 — Reference is made to zoning regulations generally allowing utilities in most zoning categories either by right or through a permitting process. A utility line, the magnitude of the NTPC's, cannot be construed to be a normal action serving a localized area. The project will impact future decisions on adjacent lands and will therefore warrant discussion.

㉒ Page 2-129 — The definition of a wilderness area implies little or no intrusion by man. The report indicates that the pipeline route will be served by access roads. The presence of any continuous access way in any or all of the five areas being inventoried by BLM would contradict the intent of a wilderness area. As the projected economic life of NTPC is 20 years, what is the future of the wilderness areas? A final decision was to have been made on the designation of the five sites. What is the effect on NTPC if the areas are found acceptable?

㉓ Page 2-134, Sec. 2.2.1.4 — The rate of littoral drift along the north side of Ediz Hook is rather rapid and is documented. The Hook is a geological ephemeral feature subject to any changes in equilibrium. This equilibrium is presently being artificially maintained by beach nourishment. The stability of the feature is dependent upon this maintenance of this equilibrium. Protection of cultural facilities are also being maintained by the revetment.

Chapter 3:

㉔ Page 3-11 — Physical Geology - EIS should describe extent to which the physical characteristics of the geologic material may change in construction phase and into operation phase. What is the potential for soil saturation, slope failure, etc., and how would this impact the pipeline?

㉕ Page 3-15, Sec. 3.1.7 — The impact of an oil spill on public water supply and existing Port Angeles marine harbor facilities (log rafting, log processing, etc.) should be discussed in detail.

㉖ Page 3-16 — We have minimal specific comments on the Oil Spill Risk Analysis since it is a preliminary risk analysis and the risk values are not final statistical representations of frequency and magnitude, and the oil spill trajectories are also preliminary and do not include the estuarine current component. When the results of the on-going studies are completed, we would like to make comments on this chapter. We do notice on your preliminary analysis that you failed to discuss the re-launching of oil after it has beached. This topic and possible net motion along the beach should be discussed in EIS.

CONT ㉗ Page 3-23 — Spill trajectories where the oil spill impacts extend significantly east of Port Angeles are of major concern. Such impacts, if confirmed, could preclude development of Port facilities at the Port Angeles site by the Marine Mammal Protection Act of 1972, as amended in 1977. The EIS should consider this matter and evaluate these impacts east of Port Angeles in relation to the Mammal Act.

㉘ Page 3-39 — The economic life of the project is 20 years. What is the economic and physical life of the refineries being built, if any, to accommodate the incoming crude oil?

The Port Angeles comprehensive plan should be discussed here.

㉙ Page 3-41, Para. 4 — This paragraph should be expanded to consider the problems that may occur if two or more ships are moored in the port when an explosion occurs.

㉚ Page 3-42 — Navigation in Port Angeles Harbor, both present prospective, should be analyzed in more detail with the use of charts, and traffic patterns shown.

㉛ Page 3-43 — Port Angeles - Operation Phase - Discuss permanent loss of previous recreational areas located at the immediate site of the new terminal facility. Throughout the operation phase of the project (and possibly beyond) this site will not be suitable or available for recreation.

㉜ Pages 3-60 and 3-61 — Surface-Fault Rupture - References to map section VI should be corrected to read section IV.

Slope Stability and Outburst Flooding - References to map section VI should be corrected to read section IV.

㉝ Page 3-61 — Operation-Phase - Outburst Flooding - Should discuss what would result if the pipeline were damaged due to outburst flooding. What quantity of oil would be released, and to what specific area of the local environment (would flow to an established streambed, widespread lowland flooding, etc.).

㉞ Page 3-65 — Operation Phase - Should discuss the possibility of soil compaction through time where soil has been excavated and replaced in pipeline trench. Low areas along the trench could occur (especially in agricultural areas) with settling.

㉟ Page 3-67 — Test water should not be discharged directly into a natural water course without treatment to neutralize bacterial agents and remove pipeline debris.

Operation Phase - If runoff flooding exposed the pipeline, what maintenance would be required (e.g., pipe segment replacement, additional fill)? What remedial action would be taken to prevent repeated exposure?

Discussion of oil spills should include estimated volumes of oil leaked in the event of a pipeline rupture or leaks below the detection limits. Leaks below detection limits could approach 4,000 barrels per day and have disastrous effects on the environment if not detected for a period of time.

㊱ Page 3-69 — What mitigation measures are being proposed to alleviate the effects of spills on municipal and private water supplies and downstream irrigation?

㊲ Page 3-72 — Abandonment - As pipe left in stream crossings deteriorated, the corrosion inhibitor inside the pipe would be released into the water. What compounds would be used for the corrosion inhibitor and what effect would those compounds have in the aquatic environment?

㊳ Page 3-78 — Spills of up to 0.5 percent loss of throughput volume are undetected by remote sensing, but must be reported visually. No mention has been made of a break occurring in a stream where the magnitude of the spill is great due to its being undetected. No mention has been made of methods for alleviating or eliminating the problem. Based on the DEIS data, volumes of up to 3,560 to 4,600 barrels per day could leak.

㊴ Page 3-84 — The whooping crane must be discussed here and in subsequent chapters as one of the endangered species potentially impacted by the proposed project.

Terrestrial Vegetation - The discussion of impacts related to an oil spill needs to be elaborated. The potential volume of undetected leaks is presented but with no discussion of the resulting adverse impacts. In mountainous areas with slow revegetation rates, the adverse impacts on vegetation could be extremely long-term. In addition, construction, operation, and abandonment activities would disrupt plant communities, and repeated disruption could drastically alter species compositions. Such changes could allow establishment of undesirable species.

The report states that if, during construction, an endangered or threatened species were in a given area, the resident environmentalist would determine that the area would be avoided. This would seem to be economically and schedule-wise infeasible.

㊵ Page 3-86 — The Map Addendum states that the population of nesting osprey at Round Lake, Idaho (P.M. 451) is the second largest in the United States. This should be documented and discussed in detail in the text of the EIS. What cumulative impacts may result from present disturbance in Heyburn State Park?

Page 3-95 — The report, in referring to cultural resources, states that ". . . . unless the final pipeline route was carefully aligned to avoid known sites, they would be directly impacted. . . ." Cultural resources should be avoided, especially if known. This problem is remedial by advance reconnoitering.

㊶ Page 3-101 — Mitigation for severe visual impacts described in segments 7 and 8 in Montana and North Dakota is not mentioned, nor is mitigation for land-use impacts. Possible conflicts in management practices and objectives in national forests, and future planned farmland practices, have not been completely addressed.

The rare and fragile POTHOLE region, principally found in North Dakota, is replete with resident and migratory birds. How will the potholes be crossed - above or below ground?

L-54 CONT

42 Page 3-103 Do the acreages mentioned in table 3.2.12-1, amounting to 12,180 acres which will be impacted by construction, include the construction of access roads, electric lines to serve pump stations and accouterments?

The report refers to large and small oil spills and length of time presumed necessary for the soil to become reproductive. No mention is made of mitigation of these losses.

43 Page 3-104 More specific discussion is needed of potential wilderness areas which may be impacted (location, size, attributes of area). Discussion of proposed RARE II areas (Forest Service) should be included.

44 Page 3-105 The report states that erosion of the soil by wind and water will be an impact until revegetation takes place. A picture on page 3-105 shows a segment of a pipeline which has been in for 13 years and still is without adequate earth cover. How does the NTPC propose to alleviate a recurrence?

45 Page 3-106 The report states spill frequency on:

| | |
|---|---|
| Agricultural Land | One spill in 0.8 year |
| Rangeland | One spill in 0.7 year |
| Forestlands | One spill in 1.6 years |
| RR Row | One spill in 5 years |

The reason for the differences should be explained.

46 Page 3-108 The question of eminent domain has not been fully broached or answered. The report mentions crossing railroads, state highways, local roads, other pipelines, airports, and television and electric lines as well as considerable private land. Does the company have the authority to condemn public or private property in the affected states?

47 Page 3-110 Will the new electrical supply system facilities require easements in addition to the pipeline easements, and do these new easements and lines, if any, require an EIS?

48 Page 3-111 If powerlines are constructed and the pipeline is abandoned, will the NTPC assure that all financial encumbrances have been paid off prior to abandonment of the pipeline? The report does not indicate who the "other" users are who are to absorb the power formerly utilized by NTPC and what the effects will be if there are no new industrial users.

Chapter 4:

49 Page 4-2 Para. 4.4 No mention is made of provisions in pipeline design in the crossing of active fault zones discussed on pages 3-52 and 53.

Page 4-2 It would be meaningless to have a wildlife biologist present during construction, operation, or abandonment as mitigation for resources lost. By the time construction activities are initiated, alinement of the pipeline would be too inflexible to avoid "impacts to previously unidentified nests or staging areas." The presence of an "inspector" could only insure that work followed designated plans, alinement, and conditions. It is much more reasonable to accurately survey the proposed corridor and evaluate impacts on previously unidentified nests, etc., during surveying for the pipeline when realinements could still be achieved. (See comment p. 1-57, no. 8.)

Page 4-6 The FEIS should acknowledge that all borrow areas and proposed access roads will be surveyed for cultural resources prior to issuance of any permits.

The report refers to Disaster Plans to monitor, detect, and eliminate leaks. Such plans should be a prerequisite as soon as a final route is determined.

Chapter 5:

50 Page 5-4 Table 5.1.4-1 Under physical geology refers to alteration of rock characteristics at Green Point. There is no rock at Green Point.

51 Page 5-5 Insufficient data has been detailed on the impact of construction or possible leaks on rivers and streams in Montana and North Dakota. Undercut streambanks and overhanging streamside vegetation provide cover for fish. Some will be lost during construction. Other aspects of potential aquatic loss should be detailed and measures for prevention or mitigation addressed. Data on sediment in spawning areas and the resultant loss of fish has not been thoroughly addressed. Will these impacts be mitigated?

52 Page 5-7 Are restrictions going to be implemented to reduce the impacts of construction during critical activity times of various wildlife species (e.g., breeding, nesting, and rearing activities)?

Chapter 6:

53 Page 6-2 The statement that corridor clearing would not open new access to extensive undeveloped areas is misleading. As noted in Chapter 3, the project established a new corridor which would provide better access into all areas adjacent to the pipeline in all seasons. This would lead to increased year-round use by recreationists with a corresponding increase of adverse impacts on vegetation, wildlife, soils, etc. Construction or upgrading of roads to allow all-weather access will add to the impacts of the pipeline corridor.

Chapter 7:

No comments.

Chapter 8:

54 Page 8-2 The EIS says exchanges with Canada or Japan would not relieve the west coast surplus or meet refinery needs in Northern Tier states. This statement needs support since it is contrary to much public opinion and political pressure, both in the lower 48 states and in Alaska, especially Juneau. Reference is made to the recent article, "The Great Alaskan Oil Freeze," Business Week, 26 February, 1979, p. 77.

55 No cost comparison for transporting or transhipping of Alaskan Crude Oil and Northern Tier States has been volunteered. A comparison of costs for all construction, operations, and maintenance should be forthcoming. Only first costs of pipeline facilities are addressed in the DEIS, which provides a very incomplete picture. Operation of costs, including shipping costs for each of the proposals, should be included. An analysis of effectiveness of each of the alternatives in serving the study objective should also be included.

56 The draft states that coal, solar energy, and synthetic crude are not addressed because they do not meet the objectives of the proposal. This is true in limited scope, but one ultimate aim of any proposal is to provide the Northern Tier and some inland states with energy. This being the case, all facets of energy production should be viewed, not the impact - economic or social - which using less Alaskan Crude Oil will have on the economy of Alaska. The economics and environmental and social impacts of all energy sources should be addressed.

57 Pages 8-5 and 8-6 The pipeline systems on these pages do not appear to be alternatives to the proposed system since the "Long Beach to Midland, Texas" apparently will not be constructed and the "Panamanian Transhipment" is nearing completion.

58 Page 8-7 Curtailing production at Prudhoe Bay is ruled out since it would adversely impact the Alaskan economy. In 1979, Alaska is projected to make about $500 million from oil revenues. The state has revised overall oil taxes 900 percent in the past decade. While Alaska is not rolling in wealth, the economy's ability to survive a curtailment should be investigated before being discussed so casually and used to justify a 1,500-mile pipeline. This same comment was made on the preliminary draft EIS.

59 Pages 8-14 and 8-15 Figures 8.4.1.1-2 & 8.4.1.1-3 These figures showing the trajectory of oil spill at Cherry Point during March and September do not seem to be referred to or discussed in Chapter __. Since all the oil spill trajectories for the Northern Tier ports and onshore facilities alternatives in this chapter are based on the same preliminary trajectory model as Port Angeles, we would like to comment on them when the on-going studies are completed and final analysis made available to us.

60 Page 8-98 Figure 8.4.3.1-1 System alternatives seem to relate only to transhipment of Alaskan oil which represents about 30 percent of the proposed Northern Tier pipeline capability. System alternatives for the remaining 70 percent of the pipeline capability should be discussed.

Chapter 9:

61 Page 9-6 U.S. Army Corps of Engineers, Seattle District (COE): Should read in part, "Section 10 of the Rivers and Harbor Act of March 3, 1899 (30 Stat 1151; 33 USC 403) and for the discharge of dredged or fill material in waters of the United States under Section 404 of the Clean Water Act (PL 92-500, 86 Stat 816, 33 USC 1344, as amended)."

Map Addendum:

62 Page 5 Cross reference Modified Mercalli Intensity Scale with Page 2-11 of Main Draft Statement.

The notation relating to the December 14, 1872 earthquake to read "Area of probable epicentral location. . . ." There is no real evidence for the precise location.

63 Page 7 The regional "Geology and Tectonics" map is perhaps appropriate for a general location, but has no real value in analysis of geotechnical problems along the route.

64 Page 9 No mention is made of the depths below the surface to which soil classifications are pertinent. No explanation is given as to what these soil classifications mean in simple understandable terms, thus the map is only useful to those who know the classification system.

65 Page 58 Map should have a legend to indicate the significance of the areas labelled "A" through "F".

66 Page 59 "Nonattainment Area" map should label Tanker Berths as Northern Tier's "Proposed Tanker Berths."

67 Page 66 through Page 187 Symbols for "Major River Crossings" should be changed to denote only Major River Crossing without stating whether or not a Corps of Engineers permit is required.

Numbering system for Major River Crossings should be continuous.

All maps should have the names of the rivers shown, specifically when there is a pipeline crossing.

Suggest adding several color or false-color infrared photographs of streams at the location of pipeline crossing.

The alinement sheets are not adequate for detailed project review at scale of 1:250,000 or 1" = 20,800' or 1" = 4 miles. Suggest the reviewer be referred to locations where maps are available for review at a scale of 1" = 1,000'.

68 Page 73 through Page 125 Alinement Sheets: Geologic data presented on these sheets are inadequate to determine potential geologic hazards along the route. Soils classifications used may be appropriate for surface soils, but do not necessarily reflect underlying conditions with respect to geologic hazards. A perusal of the boundary conditions of the units and an appraisal of topographic conditions with the boundaries of a soil unit indicate that significant departures from the soil assigned can be expected which may significantly alter evaluation of impact.

CONT

69 Pages 85 and 87 Extensive areas showing a potential for water erosion seems inappropriate. If the meaning relates to the erodability of materials, it's probably true. If the meaning is that erosion is likely, it does not belong, certainly in the critical column.

COMMENTS - NORTHERN TIER PIPELINE (NTP)
DRAFT EIS
NEED FOR THE PROJECT

1. The Northern Tier EIS does not adequately justify the need for so large and costly a pipeline system to either:

a. Reduce the west coast surplus of Alaska North Slope crude oil, or

b. Meet anticipated shortages of crude oil in the Northern Tier states.

2. West Coast Crude Surplus. The west coast surplus (PAD V) is estimated at 400,000 barrels per day now, with Alaska North Slope crude production at 1.2 million barrels a day. This would, of course, rise perhaps as high as 800,000 barrels a day when the Alaskan production reaches its full capacity of 2 million barrels a day. There appear to be, however, better alternatives for disposing of this surplus than the Northern Tier Pipeline. These are:

a. Convert more west coast refineries to sour crude capability, and hence reduce the foreign oil imports which are now 700,000 barrels per day.

b. Ship Alaskan oil to Japan in exchange for either Mexican oil delivered to the U.S. or Middle Eastern oil delivered to the U.S.

c. Construct the SOHIO pipeline from Los Angeles to Midland, Texas. This system would have a capacity of about 500,000 barrels per day.

d. Consider other northern pipeline. These include the Transmountain Pipeline with a port at Cherry Point (which now is illegal according to Federal law) or a port on the Olympic Peninsula at Low Point. Another alternative would be the Foothills Pipeline from Skagway, Alaska, to Edmonton, Alberta.

e. Continue shipping some crude oil through the Panama Canal.

f. Some small-scale, short-term solutions or assists would be unit trains to Montana, and barges on the Columbia River. These, however, are expensive, small-scale, and very short-term alternatives.

g. Expand the capacity of the Arco Four Corners line and tie into the Texaco-New Mexico line.

3. Northern Tier Crude Shortage. The priority one Northern Tier refineries (in the area eastern Washington to Wisconsin) have a refining capacity of only 476,000 barrels per day (maximum of 280,000 barrels per day is sour crude capacity). With the Canadian crude oil curtailment as originally planned, these refineries will have a need for about 100,000 barrels per day of foreign light crude, plus 120,000 barrels per day of heavy crude, most likely from Alaska North Slope. The remaining demand can be filled from domestic sources or residual Canadian shipments. The area east of Wisconsin may be better served from east coast, Gulf Coast, Midwest, or Southwest U.S. sources. There are various alternatives that appear more promising than the Northern Tier pipeline. These are:

a. Continued Canadian exports (the cutoff date has now been extended from 1980 to 1983). The Canadian reassessment is now motivated by large new discoveries in Alberta, by the adverse Canadian international balance of payment situation, and by an indication that the U.S. is willing to replace Canada's crude oil at some location on Canada's east coast.

b. Build a SOHIO pipeline (more oil from the Southwest would then be available to the Chicago area and east).

c. Import substantial quantities of crude oil from Mexico.

d. Use existing or new lines from east coast, Gulf coast, or the Southwest into the Northern Tier area.

e. Build the Northern Pipeline (KOCH) from Wood River, Illinois, to the Minneapolis/St. Paul area. This system would have an initial capacity of 130,000 barrels per day, 175,000 barrels per day later, with an ultimate capacity of 239,000 barrels per day.

f. A Transmountain pipeline, either with the Cherry Point port or a port at Low Point on the Olympic Peninsula.

g. The Foothills Pipeline from Skagway, Alaska, to Edmonton, Alberta.

h. The Williams Brothers Pipeline (recently completed) which extends from Oklahoma to Minnesota and has a capacity of 120,000 barrels per day and capability of being doubled.

i. The Platte Pipeline from Wood River, Illinois, to Montana.

j. Construction of the Texoma expansion from Cushing, Oklahoma, to Chicago with a capacity in the range of 200,000 to 400,000 barrels per day. This alternative would require expansion of the Texoma line from Beaumont, Texas, to Cushing, Oklahoma to an envisioned 420,000 barrels per day.

k. Increase the capacity of the Arco Four Corners line from 28,000 to 150,000 per day (Long Beach, California, to Four Corners, Utah) and tie into the Texaco-New Mexico line to Midland, Texas.

4. The reservations outlined above are consistent with the recently completed Department of Energy study and apparently similar to the position of the State of Minnesota.

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L-55

IN REPLY REFER TO:
1792 (321)

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

MAY 4 1979

Ms. Shirley S. Hager and
Mr. Fred H. Hager
Nine Mile Road
Huson, Montana 59846

Dear Ms. Hager and Mr. Hager:

Secretary Andrus has asked me to respond to your letter of April 16, 1979, concerning the proposed Northern Tier Pipeline.

I appreciate your interest in this proposed project, and in the potential impacts which may result. The concerns which you expressed have been transmitted to the office responsible for the preparation of the final environmental statement (FES). Although it would be inappropriate for me to respond to your specific concerns before the ES team has completed its analysis and final report, you may be assured that your concerns will be considered, along with all others, in the preparation of the FES, and in the decisionmaking process.

Again, I wish to thank you for your interest in this proposal.

Sincerely yours,

/s/ Rolla E. Chandler

Chief, Division of Lands
and Realty

✓SD, Oregon w/incoming

---

Nine Mile Road
April 16, 1979

Secretary of Interior, Cecil Andrus
Department of Interior
Washington, D.C. 20240

Dear Secretary Andrus:

We want to go on record as being opposed to the proposed route of the Northern Tier Pipeline. We live in the Nine Mile Valley west of Missoula and worry about the potential environmental damage to our area.

We are, of course, aware of our energy problems but we see no reason, if it is really needed, why existing pipelines inCanada cannot be used. It seems wasteful to endanger the land and use huge amounts of energy for construction of a new pipeline.

Also, the establishment of the power corridor this would produce is highly undesirable. It has been stated by Bonneville Power that they could use this corridor to transmit electricity from Colstrip 3 and 4. We have been reliably informed that the best and cheapest way to get the energy where it is needed is to ship the coal by rail to the site and to generate the electricity there. Again, existing railroads could use the business..probably more than the power companies.

We hope that you will decide against the immediate implementation of the Northern Tier Pipeline. We are just not convinced at this time of the need for this particular plan.

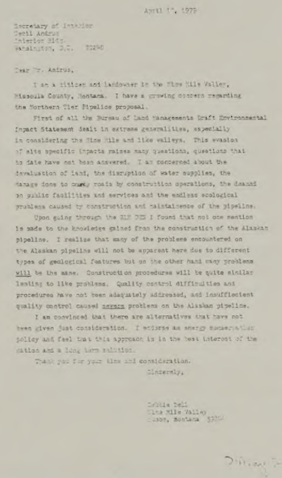
Thank you for your consideration.

Yours truly,

Shirley S. Hager
Fred H Hager

F. and S. Hager
Nine Mile Road
Huson, Montana 59846

**L-56**



April 1?, 1979

Secretary of Interior
Cecil Andrus
Interior Bldg.
Washington, D.C. 20240

Dear Mr. Andrus,

I am a citizen and landowner in the Nine Mile Valley, Missoula County, Montana. I have a growing concern regarding the Northern Tier Pipeline proposal.

First of all the Bureau of Land Managements Draft Environmental Impact Statement dealt in extreme generalities, especially in considering the Nine Mile and like valleys. This evasion of site specific impacts raises many questions, questions that to date have not been answered. I am concerned about the devaluation of land, the disruption of water supplies, the damage done to county roads by construction operations, the demand on public facilities and services and the endless ecological problems caused by construction and maintainence of the pipeline.

Upon going through the BLM DES I found that not one mention is made to the knowledge gained from the construction of the Alaskan pipeline. I realize that many of the problems encountered on the Alaskan pipeline will not be apparent here due to different types of geological features but on the other hand many problems will be the same. Construction procedures will be quite similar leading to like problems. Quality control difficulties and procedures have not been adequately addressed, and insufficient quality control caused severe problems on the Alaskan pipeline.

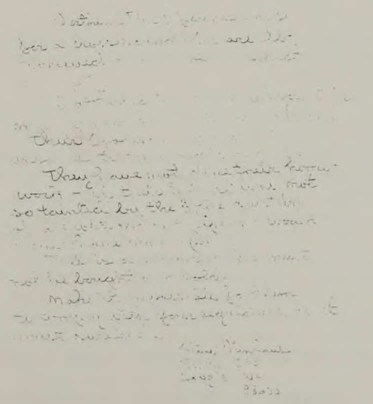
I am convinced that there are alternatives that have not been given just consideration. I endorse an energy conservation policy and feel that this approach is in the best interest of the nation and a long term solution.

Thank you for your time and consideration.

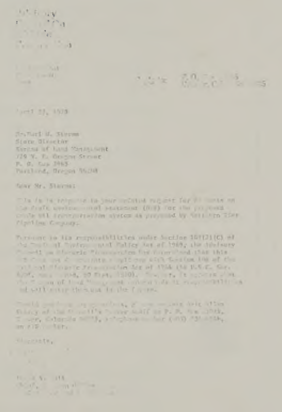
Sincerely,

Debbie Bell
Nine Mile Valley
Huson, Montana 598

**L-57**

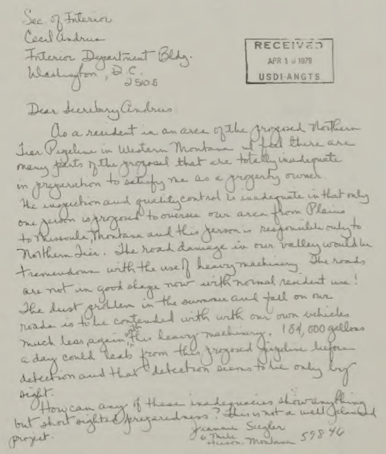


**L-58**



Mr. Murl W. Storms
State Director
Bureau of Land Management
729 N. E. Oregon Street
P. O. Box 2965
Portland, Oregon 97208

Dear Mr. Storms:



Sec of Interior
Cecil Andrus
Interior Department Bldg.
Washington, D.C.
25105

RECEIVED
APR 1 0 1979
USDI-ANGTS

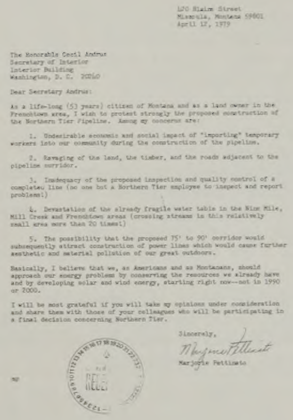
Dear Secretary Andrus

As a resident in an area of the proposed Northern Tier Pipeline in Western Montana I feel there are many parts of the proposal that are totally inadequate in preparation to satisfy me as a property owner. The inspection and quality control is inadequate in that only one person is proposed to oversee our area from Plains to Missoula, Montana and this person is responsible only to Northern Tier. The road damage in our valley would be tremendous with the use of heavy machinery. The roads are not in good shape now with normal resident use! The dust problem in the summer and fall on our roads is to be contended with with our own vehicles much less again with the heavy machinery. 184,000 gallons a day could leak from this proposed pipeline before detection and that detection seems to be only by sight.

How can any of these inadequacies show anything but short sighted preparedness? This is not a well planned project.

Jeannie Siegler
6 Mile
Huson, Montana 59846

**L-59**



420 Blaine Street
Missoula, Montana 59801
April 12, 1979

The Honorable Cecil Andrus
Secretary of Interior
Interior Building
Washington, D. C. 20240

Dear Secretary Andrus:

As a life-long (53 years) citizen of Montana and as a land owner in the Frenchtown area, I wish to protest strongly the proposed construction of the Northern Tier Pipeline. Among my concerns are:

1. Undesirable economic and social impact of "importing" temporary workers into our community during the construction of the pipeline.

2. Ravaging of the land, the timber, and the roads adjacent to the pipeline corridor.

3. Inadequacy of the proposed inspection and quality control of a completed line (no one but a Northern Tier employee to inspect and report problems!)

4. Devastation of the already fragile water table in the Nine Mile, Mill Creek and Frenchtown areas (crossing streams in this relatively small area more than 20 times!)

5. The possibility that the proposed 75' to 90' corridor would subsequently attract construction of power lines which would cause further aesthetic and material pollution of our great outdoors.

Basically, I believe that we, as Americans and as Montanans, should approach our energy problems by conserving the resources we already have and by developing solar and wind energy, starting right now--not in 1990 or 2000.

I will be most grateful if you will take my opinions under consideration and share them with those of your colleagues who will be participating in a final decision concerning Northern Tier.

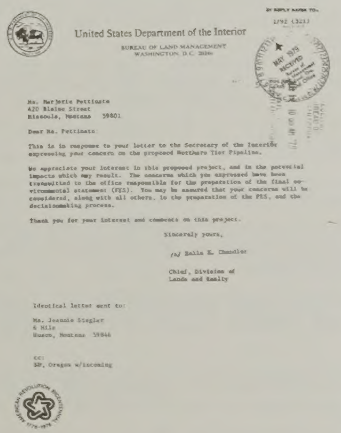
Sincerely,

Marjorie Pettinato

Marjorie Pettinato

mp

**L-60**



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
1792 (321)

MAY 1979
RECEIVED

Ms. Marjorie Pettinato
420 Blaine Street
Missoula, Montana 59801

Dear Ms. Pettinato:

This is in response to your letter to the Secretary of the Interior expressing your concern on the proposed Northern Tier Pipeline.

We appreciate your interest in this proposed project, and in the potential impacts which may result. The concerns which you expressed have been transmitted to the office responsible for the preparation of the final environmental statement (FES). You may be assured that your concerns will be considered, along with all others, in the preparation of the FES, and the decisionmaking process.

Thank you for your interest and comments on this project.

Sincerely yours,

/s/ Balla K. Chandler

Chief, Division of
Lands and Realty

Identical letter sent to:

Ms. Jeannie Siegler
6 Mile
Huson, Montana 59846

cc:
SD, Oregon w/incoming

## RESPONSES TO COMMENTS

The following section includes specific responses to specific items in the comment letters which are printed in the preceeding section. The letter numbers and response numbers correspond to the specific marked and numbered paragraphs or sentences of the comment letters. The only letter numbers which appear in this section are those for which specific responses were written. Refer to the list of comment letters received for information about the other letter numbers.

**4**

1 Copies of the DES were sent to King, Pierce and Thurston counties. As indicated in Chapter 9 of the DES and Chapter 10 of the FES, copies were sent to all counties which would have been affected by the NTPC proposal, as designed at the time of publication of the DES.

**8**

1 NTPC has indicated that it would comply with all applicable laws and regulations affecting its proposal, if it is approved. No agency has provided the BLM with a formal commitment to enforce OSHA or specific state standards if the NTPC proposal is implemented.

2 This matter has been addressed in the FES. The shortage of physicians and of hospitals with intensive care unit facilities in rural counties has been discussed in Chapters 2 and 3 in the sections on Social Conditions.

3 According to data contained in a study of pipeline construction workers (Mountain-West Research 1979), the demands for housing associated with pipeline construction projects are "very different" from other types of construction projects. The short duration of a stay in a given locale is cited as the primary reason for the difference. The study disclosed that motel and hotel lodging was used by 41.5 percent of the nonlocal workers. Another 24.4 percent lived in travel trailers. The rest found lodging in single family houses (5.7%), apartments (13.1%), mobile homes (6.8%), tents (6.8%), or sleeping rooms (1.1%).

Two important conclusions are included in the study. One of these identifies the spread of worker housing demand to other communities when facilities close to the construction site are not adequate to house nonlocal employees. The other is that pipeline construction workers are flexible in their preferences for housing types.

Material in the text of the FES discusses strains that can occur on housing. However, no significant adverse impacts would be expected to occur.

4 Because pipeline construction workers would be expected to spend a relatively brief time at any given rural location, no significant adverse impacts on school systems are anticipated.

**10**

1 Chapter 3, Under Transportation and Utilities, has been revised to include a discussion of these potential impacts.

**11**

1 This issue is discussed in Chapters 2 and 3, under Cultural Resources. As stated in Chapter 4, BLM has proposed a Memorandum of Agreement which outlines the procedures which would be followed by BLM and NTPC to ensure that cultural resources would be adequately identified and that potential adverse impacts would be avoided or mitigated.

2 Adequate time to identify cultural resources, to assess their significance and, if necessary, to mitigate adverse impacts would be provided under the provisions of the Memorandum of Agreement (MOA) which has been proposed by the BLM in order to bring the FES into compliance with Section 106 of the Historical Preservation Act and with 36 CFR Part 800. If the NTPC project is authorized, stipulations on the permit from the Department of the Interior would include the provisions of the MOA.

3 The treatment of cultural resources in both the DES and the FES is as complete as possible under the circumstances of this particular environmental statement project. This issue, and compliance with applicable laws and procedures, is discussed in Chapter 10.

**13**

1 The issue is discussed in Chapter 1, under Authorizing Actions, and in Chapter 2, under Land Use Plans and Zoning. Whether or not the ultimate pipeline location conforms to local zoning would be determined by state and local governments, not by the BLM.

2 The FES contains two new sections, which discuss fire and explosion risks. Odor would be a minor problem. The potential impacts from odor are discussed in Chapter 3, under Air Quality.

3 None of the proposed pump stations would be located near residential areas. BLM has determined that no noise standards would be exceeded; therefore, no mitigating measures have been proposed.

**14**

1 The West Coast Deepwater Port Facilities Study (U.S. Department of Defense 1973) determined that Grays Harbor would not be a viable location for a marine terminal for crude oil tankers. Access to the interior of the harbor is precluded by the volume of dredging required, both initially and continually for maintenance. Therefore, any terminal at Grays Harbor would have to be offshore where the wave climate is severe. The cost of monobuoys and protective breakwaters would be very high (estimated to be $1.8 billion in 1973 dollars). In addition, oil spills would have potentially severe impacts on offshore marine resources and along the entire Pacific Coast of Washington. Because of these reasons, neither NTPC nor BLM have considered Grays Harbor as a potential alternative port location.

2 The pipeline route proposed by NTPC is south of the Coeur d'Alene River, on the uplands away from the marshes (see Alignment Sheet #8 in the Map Addendum) and makes only one crossing of the South Fork Coeur d'Alene River, near Kingston, Idaho, at pipeline mile 414. Considering the actual location of the proposed pipeline route, BLM believes that the potential impacts on waterfowl and other birds in this area have been adequately discussed.

**14** CONT.

3 The potential dangers from seismic activity are discussed in Chapter 3, under Geologic Hazards. The volumes of potential pipeline oil spills are discussed in Chapter 3, under Aquatic Resources. In addition, Chapter 3 of the FES contains a new section discussing the pipeline system oil spill risk analysis.

**15** **A**

1 Chapter 1, under Authorizing Actions has been revised to include mention of this Resolution.

**B**

1 Chapter 1, under Authorizing Actions, has been revised to include mention of this motion.

**D**

1 The table in Chapter 2, under Aquatic Resources, has this information for the Souris and Red Rivers. Comparable data for the Des Lacs River is not available in published sources.

2 These soil characteristics are identified on the appropriate Alignment Sheet and in the "Key to Soil Associates in the Proposed Corridor", both in the Map Addendum. The design of the cathodic protection system described in Chapter 1 in the section on NTPC's Pipeline System, would be based on measurements of actual pipe to soil resistance. This system would provide corrosion protection under saline soil conditions.

3 The locations of the pipeline river crossings near Minot and Grand Forks are those proposed by the Northern Tier Pipeline Company. The BLM has identified the potential impacts on municipal water supplies in Chapter 3 and on the appropriate Alignment Sheets. Chapter 9, under Route Segment Alternatives for the NTPC proposal, contains a new section describing an alternative alignment which would cross the Red River downstream from Grand Forks.

4 Chapter 2, under Slope Instability, and the appropriate Natural Resources Alignment Sheet have been revised to include a discussion of landslide potential in the areas where the pipeline would cross the Des Lacs and Souris River valleys.

5 The legend locating cultural resources on the Alignment Sheets is intentionally general, in order to reduce the possibility of unauthorized identification of actual sites on the ground. The "P" in the cultural resources symbol distinguishes palentological sites from historical and archaeological sites. The appropriate Human Alignment Sheets have been revised to provide this explanation. Information about cultural resources sites is contained in the tables in the section on Pipeline System Cultural Resources in Chapter 2.

**17** **B**

1 In response to this comment a new section has been added to Chapter 9, under Route Segment Alternatives for the NTPC proposal, to present information about a route alignment alternative which would cross the Red River north of Grand Forks.

**18**

1 As discussed in Chapter 1, under the NTPC Pipeline System, the NTPC proposes to bury the pipeline below streambeds unless severe conditons make burial impractical. The BLM has evaluated the impacts of the project as proposed by NTPC. At the present time no streams have been identified which would require overhead crossings. However, NTPC is considering overhead crossings for some streams. Currently, no agencies have committed themselves to requiring overhead crossings as a means to mitigate any adverse impacts. The analysis by BLM indicates that while overhead crossings would avoid impacts on some resources, they would adversely affect other resources (such as visual quality) and would be a potential oil spill hazard because of exposure of the pipeline to vandalism.

2 The submarine pipelines from the berthing facility to the onshore storage facility are part of the system proposed by NTPC. The BLM is required to evaluate the impacts of the system as proposed by the applicant. The potential impacts from the submarine pipelines are discussed in several sections of Chapter 3. The NTPC did investigate the possibility of a land route from Ediz Hook to Green Point and determined that the potential impacts to existing public and private facilities in Port Angeles would be severe, and that the costs of implementing such a route would be extremely high.

3 As explained in the section of Chapter 1 on the NTPC proposal, NTPC no longer proposed the wedge cut into the bluff at Green Point.

4 The potential impacts of the NTPC proposal on electrical power supply are discussed in Chapter 3, under Transportation and Utilities.

5 Refer to the Response to Comment 14-1.

6 The feasibility of using unit trains as an alternative to the proposed system is discussed in the section on Other Alternatives in Chapter 9 of the FES. The use of the Milwaukee Railroad right-of-way for the pipeline is discussed in the sections on the South Fork Coeur d'Alene and the Milwaukee Railroad, Missoula, Montana route segment alternatives in Chapter 9.

7 The discussion of port and systems alternatives has been substantially increased in the FES.

8 The potential impacts to resources of the Olympic Peninsula are addressed in Chapter 3. Substantial revisions have been made because of the change in NTPC's proposal to go across Puget Sound. All potential mitigation measures to which various responsible agencies have committed themselves to enforce are discussed in Chapter 4. Since specific adverse impacts

**18 CONT**

which are considered too lightly or not at all have not been identified, the evaluation of impacts in Chapter 3 has not been revised specifically in response to this comment.

**20**

1 Chapter 3, under Transportation and Utilities, has been revised to include a discussion of these potential impacts.

**22**

1 The NTPC considered and rejected pipeline routes which would have crossed the Tacoma and Seattle Watersheds and the Spokane Aquifer. Because of the decisions by NTPC to follow other routes in these areas, it was determined that greater detail in the impact analysis was not necessary in the sections of Chapter 9 dealing with these route segment alternatives.

**23**

1 If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. At that time, non-federal entities would have the opportunity to present their concerns directly to NTPC.

**24**

1 Refer to the Response to Comment Letter 23.

**25**

1 The potential impacts of the additional storage facilities at Clearbrook are discussed in the various appropriate sections of Chapter 3.

2 In response to this comment the Minnesota Pollution Control Agency (MPCA) was consulted concerning contaminated sediments in the Red River. It was determined that disturbance of any mercury contaminated sediments which may occur if the NTPC project is constructed would not significantly increase the problems under study by the MPCA. PCB contaminated sediments do not occur within the area of potential impact by the NTPC project.

3 These bald eagles, whose nest was destroyed by a tornado in 1978, are mentioned in the table in the section on Terrestrial Wildlife in Chapter 2.

**26**

1 The project areas have been identified and it has been determined that the NTPC project, as currently proposed, would not have significant or critical impacts on either the Park or the Recreation Area.

**27**

1 Both statements are appropriate. Dredging would not be required at the proposed berth locations. However, dredging would be required for the submarine pipelines, in which case, Corps and EPA permits would be required.

2 The paragraph referred to has been deleted from the FES. If the proposed NTPC project is authorized and constructed, detailed emergency procedures would be established by NTPC and the appropriate federal, state and local governments.

3 NTPC has indicated that if their proposal is approved and implemented, they would meet with city and county fire protection specialists to design appropriate systems and personnel needs. NTPC would provide the personnel.

4 The cited text describes the system as proposed by NTPC. The figure mentioned is intended to be illustrative of the proposed onshore storage facility, but not to include all the exact details of the facility.

5 Refer to the Responses to Comments 23-1 and 27-3.

6 Refer to the Response to Comment 27-3.

7 Chapter 1, in the section on the NTPC proposal, has been corrected to include this information.

8 The cited table has been deleted from the FES. Potentially significant impacts on water quality are discussed in general terms in Chapter 3 under Aquatic Resources.

9 The figure shows the general design proposed by NTPC. Note that the drawing is not to scale.

10 The unidentified objects are valves.

11 Refer to the Response to Comment 27-9.

12 The unidentified objects are valves.

13 The cited paragraph has been deleted in the FES. Sections 3.1.1 and 3.2.1 of the FES are new sections dealing with oil spill risk analysis.

14 Refer to the Response to Comment 27-9.

15 Refer to the Response to Comment 27-9. Also, note that the cited figures have been deleted from the FES.

16 This reference to certification has been deleted from the FES. Certification requirements would be dependent on safety regulations in effect at the time of abandonment.

17 It would be taken by truck, railroad or barge to the nearest crude oil facility.

18 A precise answer to this question cannot be provided at this time. However, abandonment procedures would be subject to all permitting requirements in force at that time.

**27 CONT.**

19 Refer to the Response to Comment 27-16.

20 Refer to the Response to Comment 27-18.

21 Refer to the Responses to Comments 23-1 and 27-3.

22 The draft contingency plan submitted to BLM by NTPC is discussed in Chapter 1 of the FES.

23 Refer to the Response to Comment 27-3.

24 If the NTPC project is approved and implemented this Department would be included in the contingency plan.

25 Federal and Washington state regulations regarding disposal of oily wastes are currently being revised. Oily wastes would probably be considered hazardous substances which would have to be disposed of in a land fill operation approved for handling hazardous materials.

26 Refer to the Response to Comment 27-3.

27 NTPC has indicated that purging would be prohibited in the vicinity of marine terminal. Regulation of purging in the Strait would be the responsibility of the U.S. Coast Guard and the Canadian Coast Guard.

28 In the Air Quality section of Chapter 3, the Port Angeles Area is emphasized because that is where the highest short-term concentrations would occur. East of Port Angeles the short-term concentrations would be lower. The potential long-term concentrations in the areas east of Port Angeles are illustrated in maps in the section of Port Angeles maps in the Map Addendum.

29 The Social Conditions section of Chapter 2, under Fire Protection, has been revised to include this information.

30 The Social Conditions section of Chapter 2, under Fire Protection, has been revised to include this information.

31 The Dungeness River has been added to the appropriate section of the FES.

32 The Transportation and Utilities section of Chapter 2 has been revised in the FES.

33 The Transportation and Utilities section in Chapter 2 of the FES has been corrected.

34 As stated in the Air Quality section of Chapter 3, under Sulfur Dioxide, the city of Port Angeles would be affected by $SO_2$ emissions about 13 percent of the time. However, because of the variability of the wind, exposure at any one location, including areas east of Port Angeles, would be less frequent. See also the response to Comment 27-28. Modeling analysis indicates that all air quality standards for the purpose of protecting human health and welfare would be met. With present-state technology, the installation of scrubbers on ships' stacks is not feasible.

35 Refer to the Response to Comment 27-28.

36 The double seal floating roofs on the storage tanks would ensure that the proposed onshore storage facility would be essentially odor free. Since there would be no significant impacts from odor at the onshores storage facility site, this subject is not discussed in Chapters 3 or 5.

37 The potential impact from oil froth has been mentioned in the FES in the new section on Oil Spill, Fire and Explosion Risk Analyses.

38 Refer to the Responses to Comments 27-28 and 27-34.

39 Refer to the Responses to Comments 27-28 and 27-34

40 The potential impacts from oil spill on agricultural lands are discussed in Chapter 3 in the sections on Land Use and Soils.

**30**

1 The NTPC has indicated that topsoil would be segregated along the entire pipeline route. With regard to the other suggestions it should be noted that if the NTPC proposal is approved, NTPC would be responsible for obtaining all non-federal permits. During the permitting process, the non-federal entities would have the opportunity to establish specific mitigation measures with NTPC.

**33**

1 The appropriate alignment sheets in the Map Addendum have been revised to show the new location of Highway 2.

2 Formal commitments to these measures have not been made by NTPC or any agency. However, if the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. At that time the non-federal entities would have the opportunity to establish specific mitigation measures with NTPC.

**34**

1 The section on Projected Demand and Supply in the Introduction to the FES includes a discussion of utilization of ANS production which is based on a study by the U.S. Department of Energy (1979).

2 Retrofitting west coast refineries has been considered in the section on Other Alternatives in Chapter 9 of the FES.

3 The Introduction to the FES contains information on estimated transportation deficits in the Northern Tier states which was taken from the study made by the Department of Energy (1979). The BLM has received no information from NTPC concerning purchase agreements with oil refineries in the Northern Tier states.

**34**
CONT

4 The alternative pipeline system from Delta Junction, Alaska following the Alcan Highway and then to Edmonton is discussed in the section on Northwest Energy Corporation Alternatives in Chapter 9 of the FES.

5 The supply of ANS crude oil in excess of west coast refinery needs is discussed in the Introduction to the FES. The discussion of the Mid-Continent pipelines in Chapter 9 of the FES has been revised. The U.S. Department of Energy is doing a detailed study of the economics of the crude oil transportation system proposals.

6 Reduced Alaskan oil flow has been considered in the section on Other Alternatives in Chapter 9 of the FES.

7 NTPC has not "requested" a 90-foot construction and a 75-foot permanent right-of-way. NTPC has proposed those right-of-way widths and BLM has evaluated the potential impacts which would result from that proposal. The Secretary of the Interior has not yet made a determination on the proposal; therefore, the request in this comment for a report containing reasons for permitting a right-of-way width wider than 50 feet is inappropriate. The 50 foot right-of-way width restriction is contained in a law written in 1920 and is not considered practical for modern construction procedures and equipment. If the NTPC proposal is approved and if the law has not been changed, then NTPC would probably receive a permit for approximately 54 feet of right-of-way for those portions of the pipeline route which would cross federal lands. It is also probable that NTPC would apply for additional federal permits for use of additional working space on federal lands -- much as Alyeska did in order to build TAPS.

8 The law cited in the comment, the Minerals Leasing Act of 1920 (as amended), pertains, in this instance, to the process of granting and regulating right-of-way permits; not to the process of writing environmental statements. If the NTPC proposal is selected, then BLM would develop stipulations, which would be based on the impacts identified in this FES.

9 The development of stipulations for a right-of-way permit would take place after the administrative decision is made to approve a particular proposal. If the NTPC proposal is approved, then BLM would develop the permit stipulations which NTPC would be required to follow wherever the project would cross federal lands. The development of stipulations is not part of the process of proposal evaluation.

10 Refer to the Response to Comment 34-8.

11 There are approximately 14 pages of specific comments referring to Chapter 1 of the DES. They have not been addressed item by item for the following reasons:

1. Some comments merely report the content of the DES to the author's audience; they are not substantive comments pertaining to inaccuracies or deficiencies in the DES.

2. Comments dealing with project design issues are not responded to specifically because it is NTPC's proposal, not BLM's. BLM has presented the proposal as submitted by NTPC, and has analyzed the potential impacts of that proposal.

3. Some of the issues raised, e.g. hydrostatic testing, refer to potential impacts resulting from particular components of NTPC's proposal. They are dealt with specifically in Chapter 3 of the FES.

12 Scour depths were provided to BLM by NTPC. Estimating techniques were not described. Scour depth figures are those of the hundred year flood.

13 The table listing river crossings has been deleted from Chapter 1 of the FES. A footnote has been added to the table in the Aquatic Resources section of Chapter 2 to explain what streams are included for each basin and why.

14 NTPC's currently proposed route no longer crosses the Little Bitterroot River. Wildlife resources other than "Endangered Species" are discussed in the sections on Pipeline System Terrestrial Wildlife in Chapters 2 and 3 of the FES. Wherever significant impacts are expected to occur along the corridor the habitat is discussed as an Area of Special Concern in the Terrestrial Wildlife section. Nonendangered species are included.

15 The section referred to, in Chapter 3 under Topography/Geology, has been corrected.

16 The information presented in this comment is incomplete and misleading. The Alaska Pipeline has 2 leak detection systems. The pressure deviation system is designed to detect leaks of 1.0 percent throughput. The monitoring equipment is located on both sides of the pump stations and would be capable of detecting a leak of 1.0 percent of throughput within approximately 2 minutes of occurrence of the leak. For example, with a throughput of 1,200,000 bpd, a 1.0 percent leak would amount to 12,000 bpd. However, a leak of this size would be detected within 2 minutes; that is, after approximately 16.7 barrels had leaked. A slightly smaller leak would presumably be undetected by this system, and with this system alone, nearly 12,000 bpd could leak until detected by other means. The second leak detection system used on the Alaska Pipeline is a line volume balance system which is designed to detect leaks of 0.25 percent of throughput. The monitoring equipment meters the amount of oil put into the line at Pump Station Number 1 and the amount arriving at the Valdez Terminal. The volumes are compared

34 CONT

every 30 minutes. For example, with a throughput of 1,200,000 bpd,
16 a 0.25 percent leak would amount to 3,000 bpd. A leak this size would
be detected within 30 minutes; that is, after approximately 62.5 barrels
had leaked. A slightly smaller leak would presumably be undetected by
this system and, with this system, nearly 3,000 bpd could leak until
detected by other means.

NTPC has indicated that they would install state of the art leak detection equipment. At the time of its proposal the state of the art in pressure deviation systems was capable of detecting leaks of 0.5 percent of throughput. This would be twice as sensitive as the Alaska Pipeline system and has been available for use only since December, 1978. At the time of the NTPC proposal the best available line volume balance system was one with the same sensitivity as that used on the Alaska Pipeline. Using NTPC's proposed throughputs, a 0.5 percent leak would amount to 3,545 bpd with the throughput of 709,000 bpd, and 4,665 bpd with the throughput of 933,000 bpd. Leaks this size would be detected within 2 minutes, or after approximately 4.9 barrels or 6.5 barrels had leaked. Slightly smaller leaks would presumably be undetected by this system and, with this system alone, nearly 3,500 or 4,600 bpd could leak until detected by other means. With the line volume balance system a 0.25 percent leak would amount to 1,772.5 bpd at a throughput of 709,000 bpd, and 2,332.5 bpd at a throughput of 933,000 bpd. Leaks this size would be detected within 30 minutes, or after approximately 36.9 barrels or 48.6 barrels had leaked. Slightly smaller leaks would presumably be undetected by this system and, with this system, approximately 1,770 bpd or 2,330 bpd could leak until detected by other means.

17 Average weight per cubic foot of soil is about 90 pounds. Therefore, weight per foot of stream channel would range from 2.4 to 7.9 tons. The 3.9 tons of sediment generated from the Salcha River is within the estimated range.

18 The section on Pipeline System Aquatic Resources in Chapter 3 of the FES has been revised to include this potential impact.

19 Four crossings of the Clark Fork River have been eliminated in the proposed route. The text has been reviewed and discrepancies have been corrected in the revision.

Methodology used to determine sediment increases is presented here.

Impact of Sediment from River Crossing

In a geotechnical study done by BLM (Fugro, Inc. 1978), two factors were used for estimating material going into the streams. They are 0.5 for mechanical excavation (wheel, backhoe, dragline and clam-shell) and 1.0 for jetting. This did not take into consideration stream bed material flow rates or other factors.

19 Table 1 contains a list of factors for stream bed material used in our calculation. The suspended sediments in most cases would be made up of fine sands and smaller particles. The stream bed material has been characterized by consultants primarily by visual inspection. Because of this it is assumed that all material would have some fines that would go into suspension. A minimum factor of 0.2 was used to reflect this condition.

During low flow conditions, the sand would become suspended and bed load for a short distance downstream and would lodge between the larger gravels and cobbles. During high flow it would mix with the other bed material.

TABLE 1

Factor x to determine sediment impact.
x would be percentage of potential sediment going into suspension.

| Bed Material | X |
|---|---|
| Cobbles, Boulders | 0.20 |
| Coarse Gravel, Cobbles, Boulders | 0.25 |
| Coarse Gravel, Cobbles | 0.30 |
| Sand, Gravel, Cobbles, Boulders | 0.35 |
| Silty Sand, Gravel, Cobbles | 0.45 |
| Silt, Sand, Gravel | 0.50 |
| Peat, Silt, Sand, Gravel | 0.60 |
| Clay, Silt, Sand, Gravel | 0.60 |
| Clay, Silt, Sand | 0.65 |

The material going into suspension would pose a possible environmental problem if it settled in riffle areas where aquatic life and spawning beds are located. However, the most likely areas of settlement are in the deep holes where the flow velocities are less which would not pose as serious a problem.

The impact of trenching would be short term since the high flows of the next year would rework the sediments. The sediments created by the pipeline crossings are only a small portion of the annual sediment load of most streams, generally less than 1 percent.

Stream crossings should be backfilled with stream bed material to below the maximum stream depth. This allows the crossing to become a part of the natural channel and not cause artifical disturbances that would change the channel in the crossing area. Larger material such as riprap along the stream bottom could create turbulance that may cause downstream erosion.

34
CONT

19 Riprap placed in the trench in the scour depth could cause additional erosion to the stream as well as possibly eroding back under the pipeline and causing pipeline rupture. Replacing the stream bed material in the scour portion of the trench would not cause an unnatural condition or disturbance in the flow regime.

Estimates were made of sediment concentration added due to construction. The excavation rate was estimated for backhoe, dragline and clamshell. For the smaller streams, where trench volume was less than 300 cubic yards, computations were made using backhoe with 1 1/2 cubic yard bucket. The dragline and clamshell estimates utilized a 3 cubic yard bucket.

Since many of the streams contained large cobbles and boulders, a load factor for well blasted rock was used, giving the backhoe rate of 100 cubic yards per hour and the dragline and clamshell rate of 150 cubic yards per hour. The excavation rate was used along with a flow rate to estimate sediment addition in parts per million.

The selected flow rate was approximately 1/2 of the average annual discharge. The minimum flow was also considered.

The sediment concentration increase is reduced as flow rate increases, and would increase if flow rate decreased. The excavation rates could be reduced to reduce the sediment rate to the stream, however, the total volume of sediment would remain the same.

Much smaller amounts of sediment would be released to the stream during the pipe laying and backfill operation since most of the fine material would have been washed out during excavation.

If construction was accomplished when the flow was nearer to the minimum, the width of the stream would be less and therefore less trench would be exposed to the stream and a smaller amount of sediment would be released to the stream. The concentration increase probably would not be changed significantly from the estimated amount.

## EXCAVATION RATE FOR STREAM CROSSINGS

The possible equipment for use in excavating the river crossings are wheel excavator, backhoe, dragline and clamshell (dipper type) power shovels. Each piece of equipment has certain limitations with the wheel having the greater limitations and could probably only be used with near ideal conditions. The material needs to be gravel size or finer with only a few small cobbles and little or no water flowing. It's use will be limited to minor stream crossings.

19 The backhoe is more versatile and can handle larger material sizes, deeper trenches, and more water. It will probably be used for small river and stream crossings. The rate of trench production (footage) is a function of material and bucket size. Assuming the use of 1 1/2 cubic yard backhoe bucket, the estimated hourly production would be approximately 180 cubic yards per hour. The trenching rate was assumed to be about 100 cubic yards per hour. The dragline or clamshell would probably be used for the larger stream crossings. It is assumed that they have a larger bucket, of 3 cubic yards. This would give an hourly production of about 300 cubic yards per hour for good working conditions and general excavating. Since they will be trenching in a straight line and will require frequent moves, this factor was cut in half to 150 cubic yards per hour. The above excavation rates are based on well blasted rocks since most of the streams have boulders and cobbles as well as the finer sands and gravels.

TABLE 2

| | Bucket Size | Rate Per Hour (cubic yards) | |
|---|---|---|---|
| | | Good Condition | Stream |
| Backhoe | 1 1/3 cubic yards | 180 | 100 |
| Dragline | 3 cubic yards | 310 | 150* |
| Clamshell | 3 cubic yards | 310 | 150* |

* Based on a bucket fill factor of 0.75 and a hardness factor of 0.65 which is on the lower side of medium hard.

Stream Material Size Classification

| Type | Size Ranges |
|---|---|
| Boulders | > 10" |
| Cobbles | 2.5 to 10" |
| Gravel | 2mm to 2.5" |
| Sand | 0.05mm to 2mm |
| Fine | 0.062 to 0.25mm |
| Medium | 0.25 to 0.50mm |
| Coarse | 0.50 to 2.0mm |
| Silt | 0.004 to 0.062mm |
| Clay | 0.0005 to 0.002mm |

Calculation to determine amount of material exposed to erosion while excavating in stream:

1. Bottom width of trench (78" = 2.17 yards).

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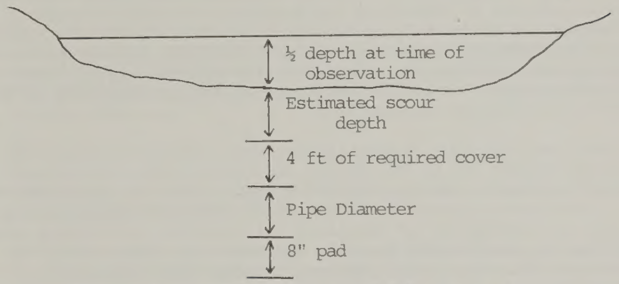
CONT

2. Depth of excavation below low point in stream bed.



TOTAL TRENCH DEPTH = $\sum$ of all depths shown above

$Dt = Ds + Dc + Dp + Db$

Dt = Total Depth

Ds = Depth of scour
Dc = Depth of required cover below scour depth (48")
Dp = Diameter of Pipe (42")
Db = Depth of bedding material (8")

3. Average depth of excavation $Da = Dt + \frac{Df}{2}$

Da = Average depth of excavation

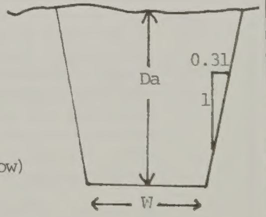
Dt = Total depth from above
Df = Maximum depth of flow at time of cross section observation

4. Slope sluffing at rate of 0.31/1 = horizontal/vertical

5. Equation for volume of material removed:

$$V = \frac{[DaW + Da^2(0.31)]\ L}{27}$$

Where:
V = Volume of material excavated in cubic yards
Da = Average depth of trench
W = Width of trench
L = Length of trench in channel (see item 7, below)



19 6. Sediment to stream = V x F

V = Volume of material
F = Factor depending on material excavated, (see table above with Bed Material Factors)

7. Length of trench in channel was assumed to be (min. Width + observed width)/2.0.

8. Depth of water is assumed equal to observed depth ÷ 2.

Calculation of pipe length for major river crossings.

1. The lengths would be based on multiples of 40' to prevent cutting of pipe.

2. Length of horizontal section will be 100-year flood water surface width plus 15' on each end before the bend starts.

3. One bend per length of pipe will be made. Two lengths per side will be used to approximate the length (80' minimum per side). 80' total beyond horizontal sections to valve on each side.

20 Slumping of the trench sides and material washing into the trench were accounted for. Also, refer to the Response to Comment 34-19.

21 Sediment increase projections are for the area immediately below the crossing. Depending on flow condition and mixing, these conditions could exist for several miles downstream. Material below the river bottom was considered in the calculations.

22 Maximum oil spill potentials were calculated using only the distance between valves. The minimum detected spill ranges from 490 barrels to 6360 barrels, not barrels per day. The minimum spill of 3540 barrels per day is correct.

23 References are identified in the section on Pipeline System Aquatic Resources in Chapter 3 of the FES. The text has been revised to include more discussion on downstream sediment transport and oil spills.

24 Revegetation plans are those proposed by NTPC.

25 Screening details have not been provided by NTPC.

26 Potential impacts resulting from hydrostatic testing are discussed in the section on Pipeline System Aquatic Resources in Chapter 3 of the FES.

27 Many small streams are important spawning areas but have not been specifically identified.

**34**
**CONT**

28 NTPC has indicated that aerial spraying of herbicides would not be used, but that truck mounted sprayers or hand sprayers would be used to apply herbicides under certain conditions. Standard industry practices vary from region to region, but frequently include herbicide application. NTPC would also use mowing and cutting methods where appropriate.

29 Poaching has been included as a potential impact in the section on Pipeline System Terrestrial Wildlife in Chapter 3 of the FES.

30 Definitions for the impact values are provided in the Terrestrial Wildlife sections of Chapter 3.

31 A figure in the section on Pipeline System Terrestrial Wildlife in Chapter 3 describes periods of greatest sensitivity for various species, including bighorn sheep. Discussion of impacts in the sections on Terrestrial Wildlife in Chapter 3 does not imply that the impact is condoned by BLM. It is BLM's responsibility to identify the potential impacts which could occur.

32 The serving utilities are identified in a table in the section on Pipeline System Transportation and Utilities in Chapter 2.

33 The cited text indicates that this would be a positive and a negative impact.

34 Refer to the Response to Comment 8-3 concerning the study of pipeline construction workers. The text of the FES has been revised to present current workforce projections. "Local" refers only to workers living in their own homes while working on the project. "Instate" workers include all state resident workers, whether living at home or away from home. "Out-of-state" workers include those who live outside of a particular state before a project job begins.

35 Chapter 4 has been revised in the FES. BLM procedures for handling mitigation measures in this environmental statement are explained in the introduction to Chapter 4.

36 This item has been corrected in the FES.

37 The Summary of the FES has been completely re-written to be consistent with the FES. Tariff estimates for each of the Title V project applicants are included in the appropriate sections of Chapter 1 of the FES.

**35**

1 Refer to the Response to Comment 18-6.

**36**

1 The potential effects of the proposed project on population and employment are discussed in the sections on Pipeline System Economic and Social Conditions in Chapter 3. It has been determined that the proposed project would probably not have significant effects on the location or pattern of development in King County. Construction of the project would most likely not have any significant effects on housing or the provision of public service in rural King County since the proposed pipeline route through the county is within the 50-mile commuting distance of Seattle. Housing costs would probably not be significantly affected by the availability of construction workers since workers skilled in housing construction would not be expected to find work in pipeline construction

**37**

1 The design specifications for the NTPC proposal which are described in Chapter 1 are those proposed by NTPC. If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. At that time the non-federal entities would have the opportunity to establish specific mitigation measures for resources under their jurisdictions.

**40**

1 On February 21, 1979, the U.S. Department of Energy published a Draft Report entitled Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000. Information from this report has been incorporated into a revised discussion of Projected Demand and Supply in the Introduction to the FES.

2 Conservation has been discussed in the section on Other Alternatives in Chapter 9 of the FES.

3 Placing dollar values on such impacts would be a highly speculative process as there are no systematic criteria available for doing so. Therefore, these potential impacts are discussed in the various sections of Chapter 3, but not with dollar evaluations.

**43**

1 The route segment alternative along the South Fork Coeur d'Alene River has been discussed in Chapter 9 of the FES.

2 If the NTPC proposal is approved, withdrawal and discharge locations for hydrostatic test water would be determined during development of final project design specifications. If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. At that time the non-federal entities would have the opportunity to establish specific mitigation measures, for those portions of the NTPC project under their jurisdictions. In addition, permits would be required by the U.S. Environmental Protection Agency for hydrostatic testing activities.

3 As stated in Chapter 1, the Contingency Plan would be reviewed and approved by appropriate government agencies. The proposed pipeline leak detection system, capable of detecting leaks as small as 0.5 percent of pipeline throughput, is the most sensitive system available with existing technology.

**CONT**

Also, refer to the Response to Comment 34-16 for an additional discussion of leak detection systems.

4 The potential impacts from abandonment of the proposed system are discussed in each section of Chapter 3. In most instances, those impacts are not quantified nor specifically detailed - it would be highly speculative to make assumptions about the precise condition of environmental resources 20 years from now.

5 The table in Chapter 1 summarizing project approval requirements has been revised to include mention of Section 208 of the Federal Water Pollution Control Act of 1972, as amended. The potential impacts on water quality are discussed in Chapter 3 of the FES.

6 The need for and possible ways of controlling access to the pipeline corridor would vary greatly along the route. Specific control measures could be included as stipulations on federal and non-federal permits.

7 It is not known what commitments of state or local resources would be necessary to monitor construction and operation of the NTPC project, if authorized. An estimate of these commitments would be highly speculative at this time.

**47**

1 The Alignment Sheets have been corrected.

2 The table in the section on Pipeline System Terrestrial Wildlife and the Natural Resources Alignment Sheet have been revised to include this information.

3 The correct names have been inserted.

4 Suspended sediment increases and resulting secondary impacts are the major concerns from construction activities. Because of the large volume of water in the Columbia River, the slow velocities in this river reach, the lengthy construction period, and the stream bed composition, anticipated sediment increases would be in the order of 10 milligrams per liter. An increase of this order of magnitude wasn't considered significant, so no notation was made on the alignment sheet.

5 In the section on Interrelationships in Chapter 1 of the FES, the statement pertaining to the Bureau of Reclamation has been revised to include this information.

**49**

1 New sections on Port, and Pipeline System Oil Spill, Fire, and Explosion Risk Analyses have been included in Chapter 3 of the FES.

**50**

1 The specific places where such impacts might occur cannot be identified at the current stage of NTPC project design development. The section on Pipeline System Topography in Chapter 3 designates, by pipeline mile, those sections of the proposed corridor within which such impacts could occur.

2 The impacts on salmon spawning areas are discussed in detail in the section on Pipeline System Aquatic Resources in Chapter 3. The degree of impacts on salmon spawning areas would vary depending on many natural and project-related factors. Some areas could receive minimal impacts while other areas could receive severe impacts. Severe impacts representing a 'worse case' situation are expected to affect small areas only, and would probably occur infrequently. Because of these factors, the degree of impact on salmon productivity cannot be specified.

3 The potential impacts of the proposed tree-free corridor in forested areas are discussed in several sections of Chapter 3 of the FES. Social costs, which cannot be quantified in terms of potential impacts on particular individuals or groups, are not specifically discussed. The sections on Social Conditions in Chapter 3 do discuss opposition to the NTPC proposal which has been articulated by various groups and individuals.

4 The design and locations of the pump stations have been designated by the applicant as components of their proposal. The potential impacts of the pump stations on noise and electrical power are discussed in the sections on Pipeline System Noise and Pipeline System Transportation and Utilities.

5 Refer to the Response to Comment 18-6.

**51**

1 The FES presents a study of a 2-mile wide corridor - the precise pipeline alignment within that corridor will not be determined by NTPC unless the project is authorized. The pipeline right-of-way could be entirely or partly within an existing right-of-way, it could be adjacent to an existing right-of-way but on entirely new property, or it could be on a new right-of-way which is parallel to, but at some distance within the study corridor away from an existing right-of-way.

2 The pipeline would have little impact on the productivity of land already irrigated. Therefore, only the total amount of agricultural land which would be disturbed is discussed; and a separate category for irrigated land is not included. The potential impacts of the pipeline on future irrigation and drainage projects are discussed only in general terms, since site specific impacts cannot be assessed in the context of a study of a 2-mile wide corridor and without details of the future projects which might be disturbed. None of the zoning ordinances reviewed, with the possible exception of that for Clallam County, Washington, contain provisions that would exclude pipelines. Since most types of land use are compatible with buried pipelines and since much of the proposed pipeline would follow existing transportation and utility corridors, it has been determined that future land-use planning and zoning decisions would not be significantly constrained by the proposed project.

3 The maps and table of soil associations in the Map Addendum indicate the locations, the shrink and swell characteristics, and the revegetation capabilities of soils that would be crossed by the proposed pipeline. Consultations with mining and pipeline engineers have indicated that there would be no significant problems with pipeline construction through bentonite deposits. No areas lacking adequate amounts of fill materials have been identified.

4 Chapter 9 of the FES has been revised and expanded to include discussions of several additional route segment alternatives in Montana.

5 The proposed leak detection system is the best available with existing technology. Refer to the Response to Comment 34-16 for an additional discussion of leak detection systems.

6 Environmental impacts of spilled crude oil are discussed in several sections of Chapter 3. The FES also contains an additional section dealing specifically with pipeline oil spill, fire and explosion risk analyses.

Time estimates for flushing crude oil from the shallow ground water aquifer in the Helena area is extremely difficult to predict. The coefficient of permeability, the hydraulic gradient, and the porosity of the aquifer are unknown variables required for a velocity estimate of ground water. If the ground water velocity was known, an assumption of oil viscosity to ground water velocity would be needed. Because oil molecules are much larger than water molecules, the insoluble fractions of oil would move at a slower velocity than the water. The soluble oil fractions, on the other hand, would move at the same speed as the ground water. Time of "flushing" would also depend on extent of the aquifer to be purified, volume of oil to be removed, and type of oil recovery system utilized. A very gross estimate of flushing time may be determined by using permeabilities for soils within the basin. Assuming a maximum average velocity of 2 inches per hour, water would move 1460 feet in a year. Assuming a 40:1 viscosity to velocity relationship, oil would move less than 50 feet in a years time. This slow oil velocity allows for recovery of oil downgradient, reducing the extent of an aquifer impacted.

It has not been possible to obtain information relating the size of an oil spill, to the size and character of a groundwater system, to the rate of recovery. Because of the highly variable nature of the factors involved, a great many assumptions would have to be made. The relationships that would result would not be representative of the real world.

Removal of oil via wells, trenches, etc. downgradient of the spill, followed by natural or accelerated flushing is the type of ground water purification system that may be instituted.

It would be reasonable to assume that NTPC would be liable for spills for which NTPC is responsible. Presumably, if a spill is caused by the action of some other party, that other party would be liable. It is not expected that insurance premiums or property values would be significantly affected by the pipeline. However, property values are highly variable with respect to specific local conditions and it is conceivable that there are some localities in which the presence of the pipeline would be perceived as an additional value or as a detraction of enough merit to affect property values.

7 On the basis of available information, it appears that directional drilling is not feasible for stream crossings with pipe of the diameters (40" and 42") proposed by NTPC.

8 The details of construction and timing would be established in easements with landowners obtained by NTPC only if the project is authorized.

9 If the NTPC proposal is approved, NTPC would be responsible for making such arrangements with the conservation districts when obtaining the required permits.

10 Specific answers to these questions cannot be provided at the current stage of development of the NTPC project design. If the project is authorized, withdrawal and discharge locations and timing of hydrostatic testing will be determined during final design stages. Stipulations concerning hydrostatic testing may be included in the federal right-of-way permit; and, in addition, permits will be required by the Environmental Protection Agency for testing activities.

11 Pipeline construction across seep areas would be avoided if possible. If saline seep areas cannot be avoided, no geologic effects are anticipated. Potential hydrologic effects could result from water moving from the saline area to adjacent non-saline areas, making the latter areas saline and potentially less productive. If seep areas drained they would become less attractive to wildlife and potentially more productive for agriculture. NTPC proposed to prevent internal drainage through the pipeline trench with plugs of impervious materials. No specific measures are proposed for restoration in saline seep areas. In specific instances, if they occur, it would be the responsibility of the landowners to make arrangements for restoration with NTPC when easements are established. See Chapter 1 and the Response to Comment 15D-2 for discussions of corrosion protection.

12 The description of pipeline construction methods in the section of Chapter 1 dealing with NTPC's proposal has been revised to indicate that NTPC proposes to test all field welds by the radiographic method. The tests would be carried out by an independent contractor.

13 The figure illustrating Pipeline Trench and Backfill Requirements depicts the "minimum" requirements for the excavation across streams and over land. As such, the figure is accurate. Recognizing the sloughing potential of stream crossing trenches, the estimated trench volume was adjusted accordingly. Note the trench volumes in the table on Estimated Sediment Increase in the section on Pipeline System Aquatic Resources

**51** CONT

in Chapter 3 are not simply a result of multiplying length, depth and width estimates and converting to cubic yards. This adjusted volume was utilized in the estimated sediment increases from construction.

Construction work in streambeds would probably not cause siltation sufficient to foul up irrigation systems. Intensity of potential impact would depend on the hydraulic characteristics of the stream, size of sediments, and distance of intakes from proposed crossings. Minor impacts in localized areas may occur.

14 No, the use of public rights-of-way for pipeline purposes would have to be obtained in accordance with the regulations of each affected public agency.

15 NTPC has not proposed such a program to BLM as of this time. The question of whether or not NTPC would be willing to fund a state quality control program would have to be addressed to NTPC.

16 A foreign source embargo would cut off the supplies from that source to any refineries supplied by the proposed NTPC pipeline as well as to any other users of that crude in the U.S. The pipeline would probably carry crude oil from other sources to whatever extent it could be delivered to affected refineries more economically than those refineries could obtain by other means. Clearly, the many unknowns in this hypothetical case make a more precise answer to this question impossible. The retro-fitting of refineries in the northern tier states to process additional ANS crude is not considered in this statement since such action by those refineries would be dependent upon the availability of a transportation system to deliver it. This FES evaluates several proposals to provide that transportation system.

17 The pipeline would be privately constructed, and its costs would be recovered from the tariffs charged. It would not be used by refineries unless the delivered costs of crude supplies were less than those from alternate sources. If it were not used, the project costs would not be recovered by the investors. Lower refinery costs should be reflected in lower consumer prices. The potential changes in prices of delivered crude or petroleum products cannot be estimated with any validity, and such estimates are not considered necessary to the statement.

The estimated costs of the NTPC proposal and its alternatives were reviewed by the Department of Energy in its Draft Report - Crude Oil Supply Alternatives for the Northern Tier and Inland States. It should be noted that the Trans-Alaska Pipeline was a pioneer project in an Arctic environment and is not an appropriate comparison for the current proposals.

18 The rate of return and operating life have not been determined for the proposed projects. They will be determined by the regulatory agency when a proposed tariff schedule is submitted. The Department of Energy (Draft Report 1979) developed tariff estimates based on an assumed 8 percent rate of return and an assumed 20-year operating life for the NTPC proposal. Differing assumptions (usually based on company information) were made for other proposals.

19 BLM has no information on throughput contracts which NTPC may or may not have negotiated. This information was not necessary for the evaluation of the potential environmental impacts of the NTPC.

20 Oil spill risk for tanker traffic from Valdez was addressed in the Final Environmental Statement for the Crude Oil Transportation System as proposed by SOHIO Transportation Company May 1977, prepared by the U.S. Department of Interior, Bureau of Land Management, and has not been repeated in this Environmental Statement. Vulnerability in the event of war or sabotage is a subject for consideration in the Presidential Report mandated by Title V of P.L. 95-617 (See Introduction to the FES).

21 See the table below for the distribution of northern tier states crude oil production. The Department of Energy (1979) reported that "The crude oil distribution...assumes that domestic production represents long-term ownership patterns and that these patterns will prevail, or that "trades" for other domestic crudes will result in the same net outcomes.

PROJECTED CRUDE OIL PRODUCTION AND DISTRIBUTION
FOR NORTHERN TIER STATES, 1980
(Thousands of barrels per day)

| Producing State | Crude Production | Distribution of Production<br>Same State | <br>Other NT States | <br>Outside NT States |
|---|---|---|---|---|
| Montana | 92.9 | 26.8 | 60.3 | 5.8 |
| Wyoming | 352.6 | 137.9 | 134.3 | 80.4 |
| North Dakota | 49.4 | 28.8 | 20.6 | -- |
| Illinois | 72.1 | 54.1 | 18.0 | -- |
| Indiana | 44.2 | 19.6 | 24.6 | -- |
| Michigan | 25.5 | 24.2 | 1.3 | -- |
| Ohio | 46.4 | -- | -- | 46.4 |
| Total | 683.1 | 291.4 | 259.1 | 132.6 |

Source: Department of Energy, Draft Report 1979. Derived from table 3-12.

22 The issue of need for and utilization of ANS crude oil is discussed in the Introduction to the FES. That discussion is not particularly extensive since the purpose of this ES is to evaluate the potential environmental impacts of several specific transportation system proposals. Whether or not the nation "needs" ANS, or any other, crude oil is a separate issue beyond the scope of this ES.

23 Reallocation of domestic production is discussed in the section on Other Alternatives in Chapter 9 of the FES.

**51**
CONT

24 The question is beyond the scope of this ES, since it is not the purpose of any of the proposals to achieve energy independence. The efficient utilization of ANS crude oil would have the effect of reducing somewhat the dependence of the U. S. on imported crude.

25 It is being shipped by tanker through the Panama Canal to Gulf of Mexico and East Coast ports.

**53**

1 Keys on right hand page maps are also applicable to left hand page maps. The marine mammal and water fowl concentration maps have been revised and new maps have been added. Harbor seal haul out areas at river deltas along the Hood Canal have been shown.

2 At the current time, the NTPC project is only in the proposal stage and the FES presents a study of a 2-mile wide corridor. The precise alignment of the pipeline within the corridor would not be determined unless the project is authorized. Also note that since publication of the DES NTPC has changed its proposal to a route across Puget Sound rather than around Puget Sound along the Hood Canal. The around Puget Sound route is discussed in Chapter 9 of the FES in the section about NTPC route segment alternatives.

3 Oil spill risk analyses were based upon regression analysis of eight major ports in the U.S. Exposure variables taken into account were distance traveled and port calls per year for in-transit risk. The frequency of oil spill magnitudes have been included in the FES.

4 The Environmental Protection Agency and the Coast Guard are responsible for enforcing federal regulations affecting waste water discharge in U.S. waters. Local and state agencies are responsible for enforcing any applicable regulations within their jurisdiction.

5 Reliable information on chronic pollution at oil ports is not available. Most of the available data are based on laboratory experiments and are not pertinent to real world conditions in which the crude oil is dispensed.

6 This issue is discussed in the section on Terrestrial Wildlife in Chapter 2 of the FES. Reduction of the eagle population in the Port Angeles and Green Point area may occur

7 The potential economic costs which can be quantified are discussed in the sections on Economic Conditions. The potential impacts on the other resources which are mentioned are discussed in the appropriate sections of Chapter 3 of the FES.

8 The discussion of potential impacts from the proposed NTPC project on electrical power supply has been revised in the FES.

9 The section on Projected Demand and Supply in the Introduction to the FES has been revised. Detailed information on need for an oil transhipment facility can be found in the report by the Department of Energy (1979). Solar energy is discussed in the section on Other Alternatives in Chapter 9 of the FES.

**55**

1 Chapter 8 of the FES contains a discussion of the Northwest Energy Company (Foothills Pipeline Company) proposal which is expanded considerably from that contained in the DES. These comments were considered during preparation of the revised section.

**58**

1 The sections on Pipeline System Land Use and Recreation in Chapter 3 of the FES, and the appropriate Alignment Sheet have been revised to include this information. If the NTPC proposal is approved, the precise alignment of the pipeline within the 2-mile wide study corridor would be determined with consideration of local land uses and landowner requirements.

**59**

1 The table of Water Quality Characteristics of Major Streams in the Missouri Basin in the section on Pipeline System Aquatic Resources in Chapter 2. includes data on water quality only, not fisheries. The information in this comment has been considered in the revision of the table of Fishery Occurrence and Fishery Value in the same section of Chapter 2.

2 The pipeline leak detection system proposed by NTPC is the most sensitive available with existing technology. Refer to the Response to Comment 34-16 for an extensive discussion of leak detection systems.

3 If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. At that time the non-federal entities would have the opportunity to establish specific mitigation measures for NTPC project actions within their jurisdictions.

4 The restriction of double trenching to irrigated and prime agricultural land has been eliminated. NTPC now proposes to segregate topsoil along the entire pipeline route. The section of Chapter 1 describing the NTPC proposal has been revised to show this change.

**60**

1 The sections on Pipeline System Recreation in Chapters 2 and 3 and the appropriate Human Resources Alignment Sheets have been revised to include identification of Land and Water Conservation Fund Act areas and North Dakota exclusion and avoidance areas.

2 In response to this comment the U. S. Fish and Wildlife Service was consulted and the sections on Pipeline System Recreation in Chapters 2 and 3 have been revised to more accurately discuss the issues raised in the comment.

3 The Area was inaccurately identified in the DES; there is no known recreation area southwest of Minot.

**62**

1 NTPC has proposed a system with ultimate throughput capacity of 933,000 bpd. As explained in Chapter 1, in the introduction to the section describing the NTPC proposal, NTPC has proposed a design which would accommodate an expansion of 350,000 bpd in order to comply with the Washington Coastal Zone Management Plan. Chapter 6 presents more information about this issue and a discussion of potential impacts. The expansion of the system to carry this additional throughput would require a separate proposal, involving NTPC and probably other companies, and would require a separate environmental statement.

2 The potential for induced petroleum-related industry is discussed in the revised section on Port Economic Conditions in Chapter 3 of the FES.

3 This information has been included in the Terrestrial Wildlife section of Chapter 2 in the FES.

4 The FES contains new sections on Oil Spill, Fire, and Explosion Risk Analyses in Chapter 3, which discuss oil spill risk analysis. The impacts of oil spills are discussed in the separate sections of Chapter 3. The sections on Port-Terrestrial Wildlife in Chapters 2 and 3 have been revised to include more detailed discussions of Dungeness Spit and potential impacts on resources there.

5 Field examinations by Shannon & Wilson (1978) and interpretation of aerial photos indicate that the majority of the sediment feeding Dungeness Spit originates from bluffs east of Siebert Creek. Consequently, the interference with littoral drift west of Siebert Creek is not considered to have a significant impact on Dungeness Spit.

6 Only one of these species, Erythronium oregonum, has been proposed for threatened or endangered status. It has been included in the table of Threatened and Endangered species in the section on Pipeline System Vegetation in Chapter 2. The other species may be rare on the Olympic Peninsula, but are widespread elsewhere and certainly are not endangered. Clarkia amoenas, var. pacifica, possibly found once near Port Angeles, is apparently limited to Lincoln County, Oregon. It does not appear on Denton's working list of rare plants for Washington.

7 This information was considered in the revision of the section on Port-Terrestrial Wildlife in Chapter 2.

8 Guidelines for preparation of the ES call for a comprehensive assessment of the beneficial and adverse effects of significant federal actions on the human environment. Results of more detailed economic analysis (especially distributional analysis of who gains, loses or is unaffected by various proposals) has normally been included in Secretarial Issue Documents to expedite the decision-making process. Traditional benefit-cost analysis has been used in program-budgeting for ranking the most efficient means of accomplishing programs or projects, as well as determination of optimum scale. The FES does not include comprehensive cost-benefit analyses. A report by the U.S. Department of Energy will include an analysis of costs and benefits. Refer to the Response to Comment 101-1.

9 The Introduction to the FES contains a revised discussion of projected supply and demand, and the treatment of alternatives, in Chapters 8 and 9, is substantially expanded. Information from the report by the U.S. Department of Energy (1979) has been used in the FES; however, the Department of Energy report should be referred to for detailed discussions of crude oil supply and demand issues.

**63**

1 The purpose of this ES is to evaluate the potential environmental impacts of several proposed crude oil transportation systems. Refer to the report by the U.S. Department of Energy (1979) for a more detailed examination of crude oil supply alternatives for the northern tier and inland states.

2 Retrofitting west coast refineries has been discussed in the section on Other Alternatives in Chapter 9 of the FES.

3 The issues of liability for oil spills and responsibility for cleanup and restoration have been historically, quite complicated. This is discussed in the section on Port Economic Conditions in Chapter 3. It is probable that liability for a pipeline leak would be born by the party responsible for the leak, which would not necessarily be the pipeline company.

**64**

1 Potential impacts to roads and highways are discussed in the section on Pipeline System Transportation and Utilities in Chapter 3. If the NTPC proposal is approved; NTPC would be responsible for obtaining all necessary non-federal permits. NTPC's actions would be subject to all applicable state and local requirements, as would the actions of any other party.

2 If the NTPC proposal is approved, NTPC would have to obtain easements from all private property owners. Responsibility for damages could be determined and assigned at that time.

3 The issue of conservation is discussed in a new section of Chapter 9 in the FES.

4 Refer to the Response to Comment 34-7.

5 Potential impacts on ground water are discussed in the section on Pipeline System Aquatic Resources in Chapter 3. If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits and easements from all private property owners. The allocation of responsibility for potential damages to non-federal lands and resources could be determined at that time.

**64**
**CONT**

6 A sincere effort has been made to ensure that the descriptive and analytical material on Social Conditions in the FES is in compliance with the appropriate regulations of the Council on Environmental Quality and with the appropriate manual guidelines of the Department of the Interior and the Bureau of Land Management.

7 The precise alignment of the pipeline within the 2-mile wide study corridor is not know at this time. Therefore, if the NTPC proposal is approved, the actual path of the pipeline across a particular piece of private property would be subject to negotiation at the time NTPC obtained easements. Compensations for easements would also be determined at that time.

8 Based on a recent study of pipeline worker habits (Mountain West 1979) and on the work force projections contained in this ES, fewer than 50 school-age children would be expected to accompany non-local workers to Missoula County at the peak construction period (April to July). They would presumably attend local schools for about one month. Most would probably reside in Missoula, the largest urban center in the county, and a few would locate in outlying towns.

In other pipeline projects reviewed in the Mountain West Study, local school officials reported no significant impacts on school systems due to increases from children of pipeline construction workers. In fact, pipeline worker's children reportedly adjusted more quickly than other new school children, since they were accustomed to changing schools frequently. In light of the above information it is anticipated that while minor short-term affects may occur in some schools along the pipeline route, no significant adverse impacts would occur.

**66**

1 If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits and easements for crossing all privately owned lands. At that time the non-federal permitting entities and the private landowners would have the opportunity to establish specific mitigation measures with NTPC.

**67**

1 This environmental statement does not analyse the impacts on any specific landowners or upon any other interest that anyone may have in specific parcels of land. Whatever legal rights any individual may have in land proposed to be crossed are beyond the scope of this statement.

**68**

1 See the Response to Comment 55-1.

**69**

1 The discussions of No Action and Delayed Action have been revised in Chapter 9 of the FES. Discussion of the west coast surplus is presented in the Introduction to the FES.

2 The section on the NEC proposal in Chapter 8 of the FES addresses these issues to the greatest extent possible.

3 The Kitimat proposal is being considered in the FES since the company applied for consideration under the Title V legislation. The Kitimat proposal, as well as the other 3 proposals discussed in this FES, is designed to deliver U.S. and non-Canadian, foreign source crude oil to U.S. markets. None of the applicants has proposed to carry Canadian crude oil in the proposed transportation systems.

4 Addressing the new Panama Canal Treaty is beyond the scope of the FES.

5 Northern tier states refineries have the capability to process varying proportions of sour crude when mixed with other crude, whereas processing sour crude alone would increase refinery investment and operating costs substantially. This issue is discussed in the revised section on Utilization of ANS Production in the Introduction to the FES.

**71**

1 The public comment period was not extended. The Introduction to the FES contains an explanation of the purpose of the FES and of the opportunities which will be available for public review of and comment on the FES.

2 NTPC's Cross-Sound pipeline route proposal has been incorporated into Chapters 1 through 7 of the FES. The description of the proposal and the evaluation of potential impacts have been revised and expanded from what was contained in section 8.4.2.1. of the DES.

The Trans Mountain proposal, described in Chapter 1, would also cross Puget Sound and Whidbey Island. Potential impacts from that proposal are discussed in the Trans Mountain section of Chapter 8.

**73**

1 Refer to the Response of Comment 71-1.

2 Island County's ground water resources are discussed in sections on Pipeline System Aquatic Resources in Chapters 2 and 3, which have been revised in response to the designation by NTPC on the Cross-Puget Sound route as its proposed alignment.

3 Refer to the Response to Comment 71-2.

**74**

1 There is no evidence that the proposed project would affect climate in any way. The documented evidence of inadvertent weather modification apparently refers to the LaPorte anamoly, observed downwind of the Gary, Indiana steel mills. This, however, involved not only sources orders of magnitude larger than the proposed Northern Tier sources, but also involved very large concentrated heat sources leading to increased storm activity. There is

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**CONT**

no comparison between the two situations. There is also no basis for comparison between impacts on the Olympic Peninsula and impacts by a similar project on the Los Angeles basin. Climate, meteorology, and existing pollution sources are very different.

Crude oil characteristics are thoroughly described in "Technical Document, Chapter 3, Air Quality Impacts" by Science Applications, Inc. Reid vapor pressure used in the analysis were based on measured North Slope values. There is no evidence that a Reid Vapor pressure of 9.5 on the average is realistic for North Slope crude. Individual samples of oil could have Reid vapor pressures much higher than the average. On the other hand, the storage tanks at Green Point would always contain a mix of many different types of crude. Therefore, assuming a highest Reid vapor pressure for all crudes in entirely unrealistic.

2 It appears that the blast effects described in the comment are for an unconfined detonation rather than a confined explosion, such as would occur in a tankship explosion. Note that the FES contains new sections on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3.

3 According to an assay by SOHIO of North Slope crude, hydrogen sulfur content is Zero when the temperature is below 200° F. At higher temperatures hydrogen sulfide emissions increase with increasing temperatures, especially when it exceeds 500° F. However, during shipment, temperatures will always be much lower than 200° F. Consequently, hydrogen sulfide emissions would be minimal.

4 The data sources referred to in this comment have been considered and cited in the sections on Marine Resources and Oil Spill Analyses in the FES.

5 The section on Port Aquatic Resources, under Physical Components, in Chapter 3 has been revised to include potential impacts resulting from the introduction of low level hydrocarbons into Siebert Creek. The use of oil separators with release into the creek has been designated by NTPC as the proposed system.

6 Purging or gas freeing of tanks is an infrequent operation, usually associated with maintenance and inspection procedures, where it is necessary for workers to enter the cargo hold. It is therefore not common and when it is performed it is usually done at sea while the tanker is in route to the loading port or a dry dock.

7 The applicant has committed itself to providing bunker fuel with a sulfur content of 0.45 percent for tankers to use while unloading in port. Enforcement would be the responsibility of the Olympic Air Pollution Control Authority. Instack monitoring on tankers is not practical. The only feasible method to mitigate sulfur dioxide emissions from tankers is to burn low sulfur fuel.

8 The analysis for nitrogen oxides was done to allow comparison with existing standards. The new standard for nitrogen oxides is presently only being considered by EPA, and therefore cannot be used in the analysis.

Ship emissions can be effectively controlled by purchasing special, low-sulfur fuel for use in port. This is done for the purpose of preventing significant deterioration of air quality in the Olympic National Park. However, modeling indicates that the ambient standards designed to protect human health and vegetation would be met even when normal fuel is burned by ships.

9 Refer to the Response to Comment 62-1.

10 Exchanges of crude oil with Japan have been discussed in the section on Other Alternatives in Chapter 9 of the FES.

11 Refer to the Response to Comment 71-1.

**75**

1 The potential impacts from the NTPC proposal on other electrical power customers are discussed in the section on Port Transportation and Utilities, under Electrical Transmission in Chapter 3. The proposed project would use up all of the allowable Class I PSD increments for $SO_2$ in the Olympic National Park. However, this would not necessarily preclude new industries or expansion of existing industries as trade-offs can be considered. New sources could only be treated on an individual basis, and it is difficult to tell what effect the proposed NTPC project would have on future industrial expansion.

**76**

1 Dungeness Spit and Sequim Bay are identified as potential impact areas on the Marine Resources maps in the Map Addendum. Lake Easton and Ollalie State Parks have been added to the appropriate Human Resources Alignment Sheet. The other parks are located along the Around Puget Sound Route which is considered as a route segment alternative in the FES.

2 Potential visual impacts on parks are discussed in general terms only because the precise alignment of the pipeline within the 2-mile wide corridor and the details of revegetation of specific areas are not known at this stage of project design development.

3 The section on Pipeline System Recreation in Chapter 3 has been revised to include more complete discussions of potential impacts on parks.

4 The floating boom would be placed close to the hull of the tanker, with spacers, to ensure the boom does not come into contact with the tanker. The additional area beyond the size of the tanker would not be large enough to cause significant interference to other harbor activities.

**76**
**CONT**

5 The table has been deleted from the FES. Stream crossings are discussed in the sections on Aquatic Resources in Chapters 2 and 3. Definitions of major and minor streams are explained there.

6 Due to the map scale of the figure, not all land use features can be shown. It is considered appropriate to designate city parks as an urban land use. The Olympic National Park Heart O' the Hills corridor has been included on the land use map.

7 The section on Port Recreation in Chapter 2 has been revised to discuss recreational uses of coast areas.

8 The section on Port Recreation in Chapter 2 has been revised to include a more complete discussion of camping activity.

9 References to tourism have been deleted from the "Social Conditions" section of the FES. Tourism is discussed in the sections on Recreation in the FES.

10 Major streams identified in the Aquatic Resources sections of Chapter 2, are those requiring U.S. Army Corps of Engineers Section 10 permits, those requiring individual or general section 404 permits, and those with a 100-foot or greater high water width. Streams supporting significant fishery resources are identified in the section on Pipeline System Aquatic Resources, under Biological Components, in Chapter 2.

11 Estimates of spill frequency can be generated only from analysis of existing data. They are only statistical estimates, not specific predictions. Improved technology or new regulations could result in lower spill frequencies, thus making the estimates too high. Factors leading to higher spill frequencies could result in data that would indicate that the estimates are too low. The statistics on oil spills were derived from analysis of data from several major port facilities in the U.S. and applied to the Strait area. The techniques used and the statistical confidence limits are discussed in detail in the reports by the Oceanographic Institute of Washington (1978). A new section of Chapter 3 of the FES contains a revised discussion of the Oil Spill Risk Analyses. Potential impacts from oil spills are discussed in several sections of Chapter 3.

12 The sections on Port Visual Resources in Chapters 2 and 3 have been revised to include discussion of these visual resources and potential impacts upon them.

13 Because of the many complex variables involved in prediction of precise oil spill impacts it was determined that reliable estimates of economic losses for all recreational facilities could not be generated. Estimates of economic losses to recreational fisheries are included in the section on Port Economic Conditions in Chapter 3. Potential impacts on the ferry system are addressed in the section on Port-Recreation in Chapter 3.

14 The Olympic National Park has indicated that the beaches are "proposed" for wilderness status. No decision had been made as of April 4, 1979.

15 The discussion of potential oil spill impacts on tourism has been revised in the section on Port-Economic Conditions in Chapter 3 of the FES.

16 NTPC has indicated that if its proposal is approved and implemented, the marina and boat launch facility would be relocated to a mutually acceptable place.

17 The NTPC proposal has been changed, so that it no longer includes the large notch cut into the bluff at Green Point. NTPC's current proposal is described in Chapter 1. The analyses of impacts in Chapters 3, 5, 6 and 7 have been revised to be consistent with the current proposal.

18 The potential impacts on resources affected by the use of Low Point as a terminal site have been considered in the revisions of the section in Chapter 9 where Low Point is discussed as an alternative to the NTPC proposal, and in Chapter 8 in the section dealing with the Trans Mountain proposal.

19 It was determined that any attempt to generate dollar values for potential impacts to recreational facilities and activities would be highly speculative and unreliable. Resources actually affected would depend upon timing and size of spill, oceanographic conditions at the time of the spill and timing and effectiveness of clean-up efforts. Then, economic effects would depend upon a variety of other factors, including public awareness of the spill and clean-up measures.

20 These park locations appear on the Marine Resource maps in the Map Addendum. Most of the parks listed are not within the Cross-Sound route corridor, but could be affected in the case of an oil spill.

21 Refer to the Response to Comment 34-16 for a discussion of leak detection system technology.

22 Refer to the Responses to Comments 76-19 and 76-20.

23 Lake Easton and Federation Forest State Parks have been included in the revised discussions of route segment alternatives.

**77**

1 Refer to the Response to Comment 55-1

**79**

1 It was decided that a revised DES would not be prepared. The Introduction to the FES explains the factors which affected that decision and outlines the special procedures which are being made available for public review of and comment on this FES.

**81**

1 The Cross-Puget Sound route segment is now the proposed route of the NTPC. Therefore, discussion of this route segment and evaluations of potential environmental impacts along it have been moved from Chapter 8 of the DES into the various sections of Chapters 1 through 7 of the FES. These comments were considered when revisions were made to implement this change in the FES.

2 Refer to the Response to Comment 79-1.

**82** **A**

1 Spill probability is considered to be the same along the entire pipeline. The FES contains a new section on Pipeline System Oil Spill Risk Analyses in Chapter 3.

2 The acres of land affected would depend upon the location and magnitude of the spill, as well as soil type, aquifer location and other factors. Because of the number of variables involved a figure on the potential number of acres of land affected can not be reliably estimated. Potential impacts of oil spills on agricultural lands are discussed in the section on Pipeline System Land Use in Chapter 3 of the FES.

3 The table on the page cited has been deleted from the FES. In the DES, the pipeline mile location for the Pacific Transmission Company natural gas pipeline was incorrect. The pipeline would be crossed in Spokane County, not Lincoln County.

4 Indications are that oil would penetrate soils at the same relative rates as water, but not necessarily at the same rates on the same soils. For instance, water would penetrate sandy soils more rapidly than it would penetrate clay soils. Oil would do likewise, but at slower rates. A great deal depends upon the viscosity of the oil (which could be highly variable with the kinds of crude oil and the temperature at the time of the spill). For these reasons it is not possible nor practical to show permeability rates of a given type of crude oil in a given type of soil at a given temperature. The viscosity of water is affected much less by temperature.

5 Skipping sections has not been proposed by the applicant, nor has any agency committed itself to requiring skipped sections as a mitigation measure. If the NTPC proposal is approved NTPC would be responsible for obtaining all non-federal permits and easements from private land owners. At that time the non-federal entities would have the opportunity to establish specific stipulations for NTPC project actions which would come under their jurisdictions.

5A The description of mainline valve locations is based on the proposal by NTPC. The evaluation of impacts is based on the system as proposed. Refer to the Response to Comment 82A-5.

6 The general impacts identified in this comment do apply to Negro Creek and the Sprague Lake drainage. Only highly sensitive areas or areas with highly valuable resources have been identified specifically in the ES.

7 Refer to Response to Comment 82A-5.

8 Standard construction practice is to obtain local permits to establish the right-of-way as a no trespassing area during construction. No significant impacts to non-construction people would be expected.

9 Potential impacts of construction and operation of the proposed pipeline to the City of Sprague and other cities within the proposed corridor are addressed in the sections on Land Use, Social Conditions and Economic Conditions of Chapter 3.

10 It is mentioned in the Columbia River Basin-Ground Water section that recharge is from rainfall and irrigation water.

11 Conformance with shoreline management ordinances, zoning ordinances and comprehensive land use plans is addressed in Chapter 1 and in the Land Use section of Chapter 3. Since detailed engineering designs have not been and will not be developed for the proposed project until permits are issued (if they are issued) detailed conformance with specific ordinances is not possible to determine at this time.

12 Alternatives which could reduce the need for a west to east crude oil pipeline have been discussed in the section on Other Alternatives in Chapter 9 of the FES.

13 Refer to the Response to Comment 82A-5. Neither NTPC nor any federal, state, or local agency has indicated a commitment to establishing and operating a mediating procedure.

14 If the NTPC proposal is approved the Contingency Plan would have to be reviewed and approved by affected governments prior to start of operation of the pipeline. The details about the length of time prior to start-up and the role of specific counties in the review process is not known at this time.

15 The section on Pipeline System Transportation and Utilities in Chapter 3 has been revised to include mention of the potential impacts of road grade changes and improperly rebuilt roads. If the NTPC proposal is approved and implemented, NTPC would be subject to federal, state and local road use regulations just as any other party.

16 These, and other, potential impacts from pipeline construction on roads and highways are discussed in the section on Pipeline System Transportation and Utilities in Chapter 3.

17 At the present stage of project design development specific locations of erosion devices could not be determined. See Chapter 3, for impact analysis assumptions and guidelines.

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**CONT**

18 The nature and occurrence of Ritzville soils in Lincoln County was brought to the attention of Butler Associates and Northern Tier Company representatives at a meeting in Ephrata, Washington on June 9, 1978. Pipeline trenching contractors are aware of the safety hazards and have developed techniques that make trenching in these soils less hazardous.

19 See Response to Comment 82A-8.

19A Neither NTPC nor any agency has committed itself to mitigation measures related to sabotage of overhead crossings. If the project is authorized, this issue would be considered when permit stipulations are developed.

20 NTPC has indicated that that it would take a maximum of 10 minutes to shutdown the entire system.

21 The precise alignment of the pipeline within the 2-mile wide corridor would not be determined unless the NTPC proposal is approved. If that occurs NTPC would have to obtain all necessary non-federal permits and would do detailed field surveys and obtain easements from private land owners. Local conditions which would affect the alignment would be considered at that time.

**B**

1 Refer to the Response to Comment 82A-1.

2 The table on Community Resources for Counties in the section on Pipeline System Social Conditions in Chapter 2 has been revised to include this information.

3 Oil spill frequencies differ according to the range of spill sizes on which they are based. The 0.0022 frequency is based on spills of 2.4 barrels or more. The 0.0012 frequency is based on somewhat larger spills. Oil spill histories of only the more modern and, consequently, less spill prone oil pipelines have been used for terrestrial oil spill frequencies which are presented in the section on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 of the FES.

4 Refer to the Response to Comment 82A-2.

5 Refer to the Response to Comment 82A-2.

6 See Response to Comment 82A-15

7 The cheatgrass problem is mentioned in the sections on Pipeline System Terrestrial Vegetation in Chapters 2 and 3 of the FES. Adequate revegetation by native grasses should prevent cheatgrass invasion of the right-of-way. Data on Adams County has been added to the table of Acres of Natural Vegetation in Terrestrial Vegetation section of Chapter 3.

8 Refer to the Response to Comment 82A-4.

9 Refer to the Response to Comment 82A-5.

10 Refer to the Response to Comment 82A-5A.

11 Refer to the Response to Comment 82A-12.

12 Refer to the Response to Comment 82A-13.

13 Refer to the Response to Comment 82A-14.

14 Refer to the Response to Comment 82B-2.

15 Refer to the Response to Comment 82A-16.

16 Refer to the Response to Comment 82A-18.

17 Refer to the Response to Comment 82A-8.

18 Refer to the Response to Comment 82A-19A.

19 Refer to the Response to Comment 82A-20

20 Refer to the Response to Comment 82A-21.

21 Refer to the Response to Comment 82A-17.

**84**

1 Approximately 50 pages of comments were from NTPC and its consultants. These comments were not give specific comment item numbers. Many of the comments were related to changes made in the proposal by NTPC following publication of the DES. Those comments were incorporated into the FES which was revised to be consistent with the system as currently proposed by NTPC. All comments pertaining to the environmental impact analyses were reviewed and considered when revisions were written for the FES.

The Summary of the FES is an entirely new document, based on the FES itself, not on a revision of the Draft Summary. Therefore, while these comments on the Draft Summary have been revised, specific responses to them have not been written.

2 Specific responses to these comments pertaining to the description of NTPC's proposal have not been written. Many of the comments are not based on NTPC's current proposal, and therefore are no longer applicable. The description of NTPC's proposal in Chapter 1 and the Map Addendum of the FES has been substantially revised to be consistent with NTPC's proposal as of April 16, 1979. The list of mitigation measures proposed by NTPC has been deleted from Chapter 1 of the FES. All those measures are considered part of NTPC's proposal and have been incorporated, where appropriate, into the description of proposed construction, operation or

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CONT

maintenance activities. They have been considered part of the proposal in the process of identifying potential impacts for discussions in Chapter 3. Also note that the Introduction to the FES explains the Title V process and that Chapters 1 and 8 provide extensive descriptions and evaluations of the proposals from the other Title V applicants.

3 Mathematical modeling of baseline air quality was done for sulfur dioxide and nitrogen oxides and results are given in Chapter 3 where modeling results are given for emissions with and without the project. In the FES, results of baseline modeling are also included in Chapter 2 to supplement existing monitoring data.

4 This has been corrected in the table on Air Quality Standards in the section on Port-Air Quality in Chapter 2 of the FES.

5 The Heart O' The Hills parkway corridor is a Class I PSD area according to the Clean Air Act Ammendments of 1977. The phrase "irregularity of shape does not allow a variance with Class I standards" meant to say that the Class I classification applies as a result of the Clean Air Act even though it is a narrow corridor. However, the phrase was very confusing and has been deleted in the FES.

6 The table referred to is based on 1976 data. The discussion of ozone concentrations in the Seattle-Tacoma area includes data for the year 1978. This has been clarified in the FES.

7 The statement in the Future Environment section of Chapter 2 said that air quality in metropolitan areas may improve for some pollutants. It is not claimed that air quality may improve with respect to all pollutants. However, in areas where standards are not being met, governmental regulations would tend to restrict additional pollution sources, thereby preventing further significant deterioration in air quality.

8 Modeling was done for total nitrogen oxides (NO and $NO_3$). This point has been clarified in the FES. Since $NO_x$ levels were well within the AAQS for $NO_2$, there would be no violation of the standard.

9 There is a rather large amount of uncertainty in the modeling. There is an inherent uncertainty in the models themselves. However, in this application the problem is compounded by uncertainty in the available meteorological data including wind and stability parameters, the effect of extreme changes in surface roughness induced by a large body of open water being adjacent to a rugged mountain range, and the effect of topography. The TCM model probably is the most accurate, with calculated concentrations most likely accurate within a factor of 2. The other models may have substantially greater inaccuracies. However, models were run such that results would tend to be conservative, i.e., they would overestimate concentrations rather than underestimate.

The TEM model would tend to be least conservative because flat terrain was assumed. However, the modeling results from WINDOW that are used in the FES, included a modification due to terrain effects. WINDOW used center-line concentrations, rather than sector averaging. Thus WINDOW would tend to give conservative results. It is believed that VALLEY gives the most conservative results as the meteorological parameters used as input are expected to occur very infrequently, and are such so as to result in highest concentrations.

Impacts on the Olympic National Park Class I area may therefore be less than indicated in the FES. However, when on-site meteorological data become available, a more accurate analysis can be made.

10 Refer to Response to Comment 84-8.

11 This correction was made in the FES.

12 The background on API Bulletin 2517 emission estimates are given in detail in SAI's Chapter 3, Technical Document. Reference is made to this document for the interested reader. It was decided that additional technical detail in the ES was unnecessary.

13 This statement is deleted in the FES.

14 The meaning of the sentence referred to has been misunderstood. Erosion rates would remain the same regardless of the relative sizes of fields and the exposed right-of-way. The sentence has been revised to clarify this point.

15 This clarification was added to the FES.

16 The statement referred to has been clarified and the issue has been treated consistently in the various chapters of the FES.

17 As stated in Chapter 2, under Slope Instability, slope instability at Ediz Hook has not been identified. It is stated, however, that because of the steep slope southwest of the hook and the soft bottom material, a submarine slump is possible although no slumping has been identified.

The bluff erosion rate established by Shannon & Wilson has been mentioned specifically in the section on Port-Topography/Geology in Chapter 2 of the FES. Slope instability at Green Point refers to the coastal bluff and is based on the Washington Department of Ecology's Coastal Zone Atlas of Washington (Clallam County) and contract work performed by FUGRO. As stated in Chapter 3, slope instability problems have not been identified at the Onshore Storage facilities. The Slope Instability portion of Chapter 2 has been rewritten to reflect this difference and to clarify the issue.

18 The 1.6 million $\text{yards}^3$/mile listed on Table 5.2.4-1 and mentioned in section 3.2.4 of the DES referred to excavation in sedimentary rock across steep terrain. Excavation in igneous, metamorphic and partially metamorphosed or well-cemented sedimentary rock would be much less, on the

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order of 290,000 yards$^3$/mile or less (depending upon the slope gradients). It is acknowledged that a one-mile side hill traverse is probably excessive consequently the figures for mountainous terrain have been revised to yards$^3$/foot. As NTPC has given no specifics concerning the working platform in mountainous terrain, the 100 foot width assumed in the section on Pipeline System Topography/Geology in Chapter 3 has been retained for calculation purposes.

19 The statement referred to in the comment has been deleted in the FES. Also refer to the Response to Comment 62.5.

20 The tables referred to have been corrected in the FES.

21 The term "rock strata" has been replaced with "geologic material."

22 Potential liquefaction problems have been identified on the maps and the reference has been corrected.

23 Milepost references have been corrected to correspond and to be consistent with NTPC's current proposal.

24 Refer to the Response to Comment 84.2 and to Chapter 4 of the FES.

25 Any significant loss of a valuable resource, such as the loss of topsoil in excess of the tolerable limits of 5 tons per acre per year, would indeed be catastrophic.

26 Additional documentation has been provided in the revision of the sections on Aquatic Resources and Terrestrial Wildlife. Baseline data on the occurrence of pollutants in marine sediments was not available; therefore both the DES and the FES indicate that dredging activities could resuspend heavy trace metals and chlorinated hydrocarbons. Additional data is necessary before a precise determination of potential impacts can be made. More detailed descriptions of sediments created by pipeline construction have been added to the FES.

27 The measures committed to by NTPC have been considered in the assessments of potential impacts.

28 The sections on Terrestrial Wildlife were extensively rewritten for the FES. However, the revisions do not necessarily bring the sections into conformity with this comment. For example, the assessments that some potential impacts would occur at distances greater than one mile from the proposed right-of-way and upstream of the right-of-way have not been changed.

29 The sections on Aquatic Resources, Marine Resources, and Terrestrial Wildlife have been revised to include more extensive discussions of those aspects of protective oil spill impacts.

30 Trajectories in the FES are for unspecified volumes. Only the centroids of each spill was tracked, for a minimum of 4 days. The table referred to in the comment had an incorrect title in the DES. The value of one spill every 181 years is the correct value for the submarine pipeline between Ediz Hook and Green Point.

31 The analysis of potential impacts on fish hatcheries has been corrected in the FES.

32 The assumption in the analysis of potential impacts from abandonment is that pipeline would not be removed from underwater segments.

33 The table referred to in this comment was incorrectly titled in the DES. It has been corrected and the data has been revised to apply to NTPC's current proposal.

34 Refer to the Responses to Comments 84-30 and 84-33.

35 The FES contains revised trajectory analyses. Generally, a trajectory was tracked for 4 days, until landfall, or meeting a boundary condition (Admiralty Inlet, Cape Flattery or the Canadian border)

36 The revised analyses in the FES include estuarine flows of 10 cm/second for March and 30 cm/second for September. However, estuarine flows were not included in the trajectories for spills in the Eastern Strait, Rosario Strait and Georgia Strait. Recent drift and data have been used in the studies for the FES. The BLM trajectory data indicates that Dungeness Spit could be affected within 27 hours.

37 The figures referred to have been revised in the FES. These trajectories include consideration of estuarine flow and the figures indicate the probable initial impact zone. The analyses for the FES include wind and current data taken from Stewart (1978).

38 The words "corridor" and "pipeline right-of-way" have been used in a consistent way in the FES.

39 The statement referred to has not been changed in the FES. It is intended only as an indication of consultation of the National Register, not as a citation of all data sources.

40 The statement referred to has not been changed since the issue of different relative significance is discussed in Chapter 3.

41 The Ediz Hook Lighthouse is mentioned in the section on Port-Cultural Resources in Chapter 2. The table listing historical resources is in the section on Pipeline System Cultural Resources and includes sites located in areas from the onshore storage facility to the delivery facility.

42 It is anticipated that intrusions on recognized tribal lands could be perceived as either direct or indirect impacts, or as no impact. It would probably depend on the cultural concept of the lands in question.

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CONT.

43 The statements referred to remain essentially the same in the FES. It is true that no direct impacts to specific sites are known to be certain to occur. It is also true that direct impacts would occur unless sites, both known and those presently unrecorded, are avoided.

44 Chapter 4 has been substantially revised in the FES. Much material that was in Chapter 4 of the DES has been deleted, so, though these comments are appropriate, the material they refer to no longer appears in the ES.

45 The chapter on Consultation and Coordination (Chapter 9 in the DES, Chapter 10 in the FES) has been revised to include mention of the proposed Memorandum of Agreement.

46 The statements referred to have been revised to be consistent with NTPC's current proposal.

47 The figures referred to have been corrected, and revised to be consistent with NTPC's current proposal.

48 The appropriate places in the FES have been corrected and the land use table and discussion have been revised to be consistent with NTPC's current proposal.

49 This comparison cannot be made since the Soil Conservation Service has not completed tabulations of prime farmland areas in each state.

50 No assumptions were made about size of spill. The discussion indicates that spill size would be a factor affecting the severity of impacts.

51 Chapter 4 of the FES has been completely revised. The lists and references to particular mitigation measures that NTPC has committed itself to have been deleted from Chapters 1 and 4 of the FES. Those measures have been considered to be integral parts of NTPC's project proposal.

52 The table referred to in the comment has not been changed. It is recognized that NTPC is committed to providing reimbursement for relocation costs. However, the new locations would be less desirable than the existing locations. Therefore, the necessary relocation of the facilities is considered to be an unavoidable adverse impact of the NTPC proposal.

53 Summer weekend peak traffic describes a component of existing traffic conditions which could be affected in some areas by construction activities associated with NTPC's proposed project.

54 The table on Port Angeles and Clallam County electrical loads has been corrected.

55 The discussion of future power availability has been revised in the FES.

56 These points have been corrected in the FES.

57 The discussion of construction personnel has not been changed because BLM's analysis indicates that the maximum number of construction personnel would be required for more than two months. This issue is discussed in more detail in the sections on Economic Conditions. The information on truck trips has been corrected in the FES.

58 The bases for the assumption are that construction workers are likely to live in urban areas and that Port Angeles has 78% of Clallam County's vacant housing units.

59 The section referred to in the comment has been rewritten in the FES, taking the points raised by the comment into consideration.

60 The table on Electrical Energy Supply Impacts has been corrected in the FES. The differences in figures between the ES and the NTPC EFSEC application appear to result from the use of calendar year data in the ES and fiscal year forecasts in the EFSEC application.

61 The discussion of power availability and related impacts has been updated, revised and corrected in the FES.

62 If sales of power to direct service industries are curtailed, there could be employee layoffs and losses of revenue. Even though those customers have nonfirm load sales agreements they could still suffer adverse impacts if deliveries of power are curtailed. The statements referred to in the comment have been reviewed and they are considered to be accurate.

63 The discussion of inspection flight impacts has been corrected.

64 Refer to the Response to Comment 84-51.

65 The text of the section on Port-Economic Conditions in Chapter 3 has been revised to present more recent information. Employment and unemployment estimates, particularly for small labor market areas, are subject to differences caused by the use of different data base, different estimation methods, or revisions of data even within the same agency. These differences indicate the uncertainty of the data, but are not considered to significantly affect its interpretation.

66 The FES has been revised to indicate the availability of about 1,000 transient rooms in Clallam County. The 1% rental vacancy estimate is taken from the report by SRI International (1978).

67 The general economic methodology for the construction impacts in the section on Pipeline System Economic Conditions has been expanded to furnish a more detailed explanation of how the construction workforce and population estimates were derived.

Population estimates were derived from monthly estimates of the work force plus additional employment generated by construction workers expenditures and local procurement by pipeline contractors. Employment estimates were

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segregated into local and non-local comp[illegible], and the transient population was estimated by factors representing the [illegible]tional family members expected to accompany transient workers.

It was assumed that the local proportion of the in-state workforce would range from 2 percent in a county of 1,000 population to 35 percent in a county with 100,000 or more, and that it would vary uniformly between those population sizes. This was based on a Mountain-West Research study of pipeline construction workers (1979) showing that local workers varied from about 1.6 percent to over 60 percent of the total construction workforce. Variations among the projects surveyed were attributable both to the size of the local workforce and to the amount of local pipeline experience.

The additional income and employment generated by local expenditures of construction workers and contractors was estimated by the use of regional gross output multipliers developed by the Bureau of Economic Analysis (1977) for the relevant BEA Economic Areas. These were the basis for estimating the indirect and induced populations.

68 It is estimated that the resident population would increase by about 380 persons during the operation phase. This estimate is based on the general economic methodology and assumptions which are described in the section on Pipeline System Economic Conditions in Chapter 3 of the FES.

69 The average workforce in Clallam County over the 22-month construction period would average about 470 workers with a one-month peak of 970 workers, based on the general economic methodology and assumptions presented in the section on Pipeline System Economic Conditions in Chapter 3 of the FES. The local (16 percent) - non-local (84 percent) distribution of the construction workforce which was assumed for Clallam County was based on the general economic methodology and the study by Mountain-West Research (1979).

70 The sections on Social Conditions provide an explanation of the methodology used for estimating increases in school enrollment. The per pupil expenditure figures have been corrected in the FES.

71 Specific references to increases in misdemeanors have been deleted from the FES.

72 The citation of the local newspaper has been deleted from the sections on Social Conditions, which have been rewritten for the FES. The Ediz Hook water line is referred to in the FES.

73 NTPC's role in providing fire protection is described in the NTPC section of Chapter 1 of the FES.

74 Refer to the Response to Comment 84-67.

75 The basis for the differential assumptions for the estimated local proportion of the workforce was discussed in detail in the Response to Comment 84-67. The estimated percentage of local workforce was revised downward, as explained in the discussion of general economic methodology in the section on Pipeline System Economic Conditions in Chapter 3 of the FES.

76 In order to identify areas that would be potentially affected by construction related transient population, the estimates were made on the assumption that construction at pump stations and delivery facilities would occur at maximum levels coincident with the greatest amount of pipeline activity in the vicinity. This explanation of the development of the transient population impacts is given in the revised text of the section on Pipeline System Economic Conditions in Chapter 3, under Population.

77 Bureau of Economic Analysis regional gross output multipliers (1977) for each BEA region were used and further refined by use of the Chalmers model (1979) to adjust for differential effects of different size market centers. This is explained in more detail in the section on Pipeline System Economic Conditions in Chapter 3 of the FES.

78 Revised total construction costs for each county are given in a table in the section on Pipeline System Resource Conditions in Chapter 3. The rationale and basis for these estimates are given in the note at the foot of the table.

79 Refer to the Response to Comment 84-51.

80 The text of Chapters 3 and 5 has been revised to be consistent.

81 The sentence referred to in the comment does not deal with oil spill risks. The commitment of resources for 20, and probably more, years to the operation of an oil transhipment facility would certainly impede the maintenance and enhancement of such existing activities as log storage and recreational boating.

82 The Stampede Pass route segment alternative has been deleted from the FES because it would not connect with NTPC's currently proposed route.

83 The potential impacts of the NEC proposal are discussed in Chapter 8 of the FES in substantially greater detail than was included in the DES.

84 The statements in the comment are correct. The discussion of the Mid-Continent Pipelines in Chapter 9 of the FES does not state that the combined network would supply all the northern tier states. The main emphasis has been placed on the ability of the pipelines to move ANS crude oil which exceeds west coast needs to Chicago.

85 Modeling of existing emissions at Cherry Point showed concentrations far exceeding the standards for sulfur dioxide. However, actual monitoring done in the area has indicated only occasional violations of the 1-hour state standard for sulfur dioxide. It is likely therefore, that either existing emissions were overestimated or that the TEM and TCM models

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gave conservative results. Modeling results for existing plus project sources showed very little difference from those for existing sources only. Thus the contribution of NTPC sources would be small. There is no indication that the NTPC project would lead to violations of the ambient air quality standards.

85A Because of physical limitations such as narrow shoulders, short sight distances, grades and curves, State Highway 112 is generally not capable of providing level of service A, even at low traffic flows. The existing level of service during peak summer use periods is probably C. Even small increases of traffic, particularly truck traffic, might lower service levels to D.

86 The observation in this comment is probably correct. Note that the section of the DES which the comment refers to has been deleted from the FES, and that oil spill risk analyses for the various port alternatives are discussed separately in each port section of Chapter 9 of the FES.

87 It is true that the NTPC system could be connected with existing pipelines to provide supplies to eastern Canada. This was not discussed in the ES since the purpose of the NTPC proposal is to supply the northern tier states.

88 Refer to the TMC section of Chapter 1 of the FES for a revised description of the TMC proposal.

89 The statement in the comment is correct. Note that it refers to a sentence from a summary paragraph which follows an extensive discussion in which the potential for use and expansion of the mid-continent pipelines is well qualified. In the first paragraph of the discussion of the mid-continent pipeline system it has been pointed out that the existing lines cannot directly supply the northern tier states west of Minnesota, but that the system could affect supplies to those states through exchanges with Canada.

90 The mention of six new lines has been corrected to five. Three of those systems do supply northern tier states. The other two systems contribute to the reduction of the west coast surplus. Because of the interconnections of the systems, as those two systems supply crude oil to Texas other supplies formerly designated for Texas could be shipped to the north. From the discussion provided it should be clear that the mid-continent pipelines do not provide direct service to all the northern tier and inland states, but that they do represent potential alternative solutions to both the west coast surplus problem and the northern tier and inland states supply problem.

91 The statement referred to in the comment has not been changed in the FES. Refer to the Responses to Comments 84-84, 89, and 90.

**86**

1 The Department of Energy has been requested to estimate likely throughput volumes and applicable tariffs under competitive conditions. However, this information was not available for incorporation into the FES. The systems and system capacities which have been analyzed in the FES are those proposed by the applicants.

2 The analysis presented in SAI's "Technical Document, Chapter 3, Air Quality Impacts" was based on tankers burning bunker fuel with a sulfur content of 2.0 percent. Subsequent to the publication of the SAI document, NTPC committed itself to 1.0 percent bunker fuel, and additional analysis was done by SAI. This new information was used in the DES. After the DES was published, NTPC committed itself to the use of diesel fuel with a sulfur content of 0.45 percent or less by tankers operating in port. The air quality analysis in the FES is based on the use of the low sulfur fuel.

3 Port Angeles is the nearest location for which historical weather data are available. Conditions at Low Point may vary from those found on Ediz Hook. However, the general topography and climate are very similar, so that long-term averages may not show significant differences. For short-term effects, the data are more questionable. However, they are the best that is available.

4 This concern is presented in detail in Comment 86-52 and is addressed in the Response to that comment.

5 The sections on Aquatic Resources in Chapter 3 addresses only those impacts associated with the NTPC proposal. Potential impacts could exceed current standards or aggravate existing violations; particularily if an oil spill should occur. Effects on water quality from treated site runoff discharges are not expected to be significant since discharges would be required to be in conformance with federal and state water quality standards through NPDES permits.

6 The values supplied by the Washington State Department of Fisheries reflect the prices paid to the fishermen. Processed values are double these prices on the average according to the 1975 Fisheries Statistical Report. Retail values average between three and four times the catch value and total impact on the state's economy may be even larger.

The commercial values of the landed fishery catch from Canadian waters adjacent to Southern Vancouver Island were revised and updated with data supplied by Canada's Department of Fisheries and Environment. Wholesale values were also included.

7 The FES contains two new sections in Chapter 3 on Oil Spill Risk Analyses. The potential impacts from oil spills are discussed in the various sections of Chapter 3.

8 All known water supplies have been identified in the Map Addendum. Quantification of impacts on water supplies is not possible because of the variety of conditions that could exist at each potential impact site.

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**CONT.**

9 It is recognized that 250 cfs (about 19 percent) of the Spokane Rathdrum Prairie Aquifer recharge comes from Coeur d'Alene Lake. However, oil spilled at the St. Joe river crossing, the nearest to the recharge area, would take at least one day to reach the lake located about 9 miles downstream. During this time various fractions of oil would be evaporating, going into solution, and falling out as tar balls, as discussed in the section on Pipeline System Aquatic Resources in Chapter 3. Toxic oil contaminated water would be introduced to the lake sediments, transmitted through the aquifer recharge zone before an impact to the aquifer would occur. Because of the weathering, decomposition, dilution, and filtering of the water transmitted through up to 35 miles of sediments, no significant impact to the aquifer would be anticipated.

10 The potential for induced petroleum-related industry is discussed in the section on Port-Economic Conditions in Chapter 3. The finding of the Department of Transportation regarding a Louisiana deepwater port had reference to the very large existing refining and petrochemical complexes on the Gulf Coast with their extensive product pipeline system supplying the country's major market. This finding was not considered applicable to the proposed project.

11 The necessary information was not available to adequately assess the potential secondary impacts associated with the TMC proposal.

12 Chapter 1 of the FES presents descriptions of the proposals of the Title V applicants. The additional environmental information which was obtained concerning their proposals is discussed in Chapter 8.

13 The potential availability of spare pipeline capacity in connecting pipelines was considered in the discussion of the proposals and alternatives.

14 The FES contains new sections on Oil Spill Risk Analyses. Because of the large number of variables (some of which have only subjective measures) involved, marine resources which would potentially be affected by oil spills are generally discussed in terms of potential significance of impacts, not in terms of relative values.

15 Potentially affected water supplies have been identified where information was available.

16 Because of the number of variables, the range of conditions for each, and the lack of available resource information, quantification of economic losses for marine resources was not performed. However, some discussion is contained in the section of Port-Economic Conditions in Chapter 3 with regard to general economic losses to fisheries which could result from an oil spill.

17 Effects on ambient air quality were presented on pages 8-10, 8-18, 8-19, 8-29 and 8-37 of the DES. Similar discussions of potential impacts on air quality in areas affected by various proposals and alternatives appear in the appropriate sections of Chapters 8 and 9 of the FES.

18 The negative effects of terminal fires and explosions have been considered in worst possible case discussions in the FES.

19 In the alternative sections of Chapter 9, the discussions of potential impacts on aquatic resources have emphasized water quality and fisheries. There was not adequate data to permit quantification of potential affects on aquatic biota other than fish or on the various specific physical components of aquatic systems. The potential for impacts on these other components has been discussed in general terms in the Aquatic Resource sections of Chapter 3.

20 If the NTPC project is authorized, these recommendations would be considered during the process of developing stipulations for the federal right-of-way permit.

21 The detailed Oil Spill Contingency Plan would not be established unless the NTPC project is authorized. At this time the information requested is not available. As stated in both the DES and the FES, the Plan would be subject to review and approval by appropriate governmental agencies prior to operation of the system.

22 The past performance record of the Lakehead Pipeline Company is not within the scope of this study. The operating procedures of Lakehead Pipeline Company would not be under jurisdiction of DOI. The Department of Transportation, Office of Pipeline Safety and appropriate Minnesota State Agencies would be responsible for regulating the operation of the terminal facility.

23 The table referred to has been revised to include reference to the SPCC review responsibility. Section 1424 reviews were not added since NTPC's proposed route no longer crosses the Spokane-Rathdrum Prairie Aquifer.

24 The precise operational capabilities of the infra-red scanning device were not available to BLM in time to include in the FES.

25 One fire boat is what has been proposed by NTPC. If the NTPC proposal is approved recommendations that more be required and that they be berthed at a safe distance from the terminal could be considered as permit stipulations by various federal, state or local regulating agencies.

26 The page reference and the mention of crude oil containing 2 to 3 percent water are confusing in the context of the subject of oil-water separators and runoff water discharge. All discharges to surface waters would be subject to NPDES permits which are administered by the Environmental Protection Agency.

27 The analysis was based strictly on the proposal submitted by NTPC. No assumptions were made concerning the availability of Jones Act tankers. No attempt has been made to develop a tanker mix or throughput scenario based on DOE's needs study.

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CONT.

28 Pipeline operating pressures would vary. NTPC has indicated that maximum allowable operating pressure (MAOP) under steady state conditions would be based on 72 percent of yield stress of the pipe.

29 The potential impacts of the proposed terminal facility at Clearbrook are discussed in the appropriate sections of Chapter 3. None of the Title V applicants have proposed a pipeline connection to East St. Louis; therefore, potential impacts of such a proposal have not been evaluated in the FES. Any system for transporting crude oil beyond Clearbrook, Minnesota is outside the scope of this ES.

30 The issue raised by this comment is beyond the scope of this ES. If one or more of the proposals which would involve construction in U.S. territory is approved, the details of inspection of construction would be specified in the authorizing document.

31 Potential impacts at stream crossings have been determined on the basis of what NTPC has proposed. They are discussed in the section on Pipeline System Aquatic Resources in Chapter 3 of the FES. If the NTPC proposal is approved, potential mitigating would probably be considered by several federal and non-federal permitting agencies.

32 This potential impact was considered when the section on Pipeline System Aquatic Resources in Chapter 3 was revised.

33 The requirement is indicated in Table 1.6-1 of the FES and is mentioned in the revision of the discussion of hydrostatic test water discharge.

34 The Department of Energy made an analysis of the Northern Tier cost estimates which included investigation of the materials on which the estimates were based in the applicant's offices, and comparisons with the historical costs of other pipeline projects. The results of their analysis indicated that the estimates were generally conservative. Their findings appear in Appendix G of the DOE Draft Report.

35 The water quality ratings and the requirements for maintaining those standards are listed in the FES. Whether or not those standards are being violated, and possible causes of any violations are issues which are beyond the scope of this ES.

36 Sensitive downstream resources and water uses are discussed in the section on Pipeline System Aquatic Resources in Chapter 2. That discussion also refers to the Map Addendum, where the locations of those resources which could be affected have been identified.

37 Public water supplies are identified in the Map Addendum.

38 Uses of ground water by aquifers is included in the section on Pipeline System Aquatic Resources in Chapter 2. Discussion of impacts to those aquifers is in the corresponding section of Chapter 3.

39 A discussion of whether or not water quality standards are being met and the causes of any violations was determined to be beyond the scope of this ES.

40 Refer to the Response to Comment 86-9.

41 Minot's water supply intakes are identified as being downstream of the pipeline crossing. Exact distance has not been determined. Information describing the water treatment system has not been obtained.

42 The appropriate changes have been made in the section on Port Air Quality in Chapter 2 of the FES.

43 The reference to Map III-2 has been deleted. The verbal description in Chapter 2 of the port and onshore storage facility areas stands without graphic representation.

44 The number of annual tanker calls at Port Angeles is shown in the DES and in the FES. Refer to the Table on Harbor Vessel Traffic in the section on Port Transportation and Utilities in Chapter 2.

45 The sections on Recreation in Chapter 2 have been re-written and now include greater emphasis on recreational activities in The Sound area.

46 Existing climate, air quality, and dispersion potential for each delivery facility location were not described, because no significant air quality impacts were identified. Conditions were not assumed to be similar to Port Angeles.

47 This comment was reviewed and it was determined that the issue raised has been adequately addressed in the section on Pipeline System Topography/Geology in Chapter 3.

48 Spat (young oysters or other bivalves) occur in Grays Harbor, Willipa Bay, Pandilla Bay, Samish Bay, Skagit Bay and Bellingham Bay.

49 The noise levels at the bottom of the page referred to are the equivalent daytime noise levels. ($^{L}$ d).

The predominant noise sources are identified on the following page in the section on Noise in Chapter 2.

50 A fuel sulfur content of 1.0 percent was used in the air quality analysis because NTPC had committed itself to the use of this type of bunker fuel. Since the publication of the DES the applicant committed itself to the use of 0.45 percent sulfur bunker fuel.

The FES does not show a change in assumptions regarding sulfur content of bunker fuel. Rather, it includes a discussion of what reductions in sulfur level would be necessary for the proposed project to meet the PSD increments. BLM also will investigate practical problems in making sure NTPC's commitment is adequately followed through in all cases.

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**CONT**

51 SAI will perform a detailed analysis of sulfur dioxide concentrations with respect to the PSD increments using a modified CRSTER or similar terrain-sensitive model for a range of sulfur values of bunker fuels. The results will be incorporated in SAI's final technical document and it is expected that the results will be available in time to be included in the FES.

52 The ballasting emissions have been recalculated assuring an emissions factor of 1.1 lbs/1000 gallons of ballast water, as given in SAI's response document to EPA comments. The appropriate changes have been made in the FES.

53 The appropriate changes have been made in the FES.

54 The BLM cannot address this issue because NTPC has not indicated what approach would be followed if this problem arises. NTPC would have a number of options in this regard, and until a definite measure is adopted, potential air quality impacts cannot be assessed quantitatively. The available options include purchasing power from outside the area, purchase of seasonal or interruptable power, or use of diesel driven pumps, as well as independent power generation.

55 This is presented in the DES and the FES in the section on Port Air Quality in Chapter 3.

56 Results of the DIFKIN photochemical model indicate that the project would cause no increase in ozone levels in the Seattle-Tacoma non-attainment area. Contributions to TSP levels in the Port Angeles non-attainment area were found to be below the level considered to be significant by EPA for offset policies.

57 BLM has been unable to obtain sufficient data from the refineries to perform an adequate assessment of potential air quality impacts caused by substitution of Alaskan oil. When contacted, the refineries indicated they did not have any plans to substitute a different type crude from what they have been using. NTPC also failed to submit any information on which types of crude would go to which refineries. Because of the lack of information, the question of impacts by refineries could not be addressed.

58 This information was considered when revisions were made for the FES.

59 The noise levels presented in table 3.1.3-2 are judged to be conservative since a worst equipment scenario was used and no shielding effect from vegetation is assumed. Construction noises are not covered under state of Washington noise regulations, and NTPC has not committed itself to any mitigation measures. A possible mitigating measure would be to require the installation of noise filtering devices on major construction equipment.

60 Refer to the Response to Comment 62-5.

61 Quantification of damages are difficult to assess in the marine environment since it depends upon what resources are present at the time of the spill, the magnitude of the spill, the time of year and existing oceanographic and meteorological conditions. The frequency of oil spill magnitudes has been included in the FES. The months of March and September were chosen because spring represents the beginning of biological production and wind data was available for only September.

62 The FES contains new sections on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3. The discussions of fire and explosion are based on a substantial amount of information that was not available when the DES was prepared (see Oceanographic Institute of Washington 1979). The various factors which could cause the differences between the explosion risk projections and damages from specific historic explosions are discussed.

63 Specific noise levels at noise sensitive receptors near pump stations could not be determined since NTPC has specified locations of pump stations only to the nearest mile. No existing noise levels in the vicinity of the pump stations are available.

64 Water quality standards for turbidity and suspended solids would probably be exceeded for a few days in most cases. Quantification of impacts resulting from oil spills is not possible because of the wide range of environmental conditions that could exist at a particular site.

65 Refer to the Response to Comment 86-9.

Locations of potentially affected potable water supplies are identified in the Map Addendum. Discussion of impacts are included in section 3.2.6.

We are unaware of reference material available discussing the ability of soil to treat and degrade spilled petroleum. So many variables exist and the conditions are so changeable that any prediction would be based on a host of assumptions. The actual reaction in the natural world would probably vary substantially from any example. Refer to the Response to Comment 82A-4.

66 This concern was considered during the revision of the sections on Pipeline System Terrestrial Wildlife in Chapters 2 and 3.

67 The discussion of impacts to utilities is expanded in the FES. The impact of NTPC loads would require additional energy purchases on the part of some local utilities. It is not apparent that NTPC energy requirements would require additional generation beyond that which is presently planned or under construction.

68 Chapter 4 has been revised in the FES. BLM procedures for handling mitigation measures in this environmental statement are explained in the introduction to Chapter 4.

69 The discussion of the potential pipeline system expansion to serve Puget Sound refineries has been substantially changed due to NTPC's new "cross sound" route proposal. The environmental and safety impacts of the potential expansion would be addressed in a separate environmental statement if the potential expansion is undertaken.

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CONT.

70 Potential air quality impacts are described in quantitative terms in several sections of Chapters 8 and 9.

71 This allegation is untrue. The analysis for Low Point and Freshwater Bay were based on Port Angeles data, as that was the nearest location for which meteorological data were available. The air quality analysis for Cherry Point is based on data from Bellingham, and the analysis for Burrows Bay is based on Whidbey Island Data.

72 The potential impacts to water quality of discharges of runoff and wastewater have been addressed in the sections on Aquatic Resources in Chapter 3. Compliance with water quality standards would be regulated by NPDES permits.

73 Impacts on noise sensitive receptors could not be quantified due to the fact that the analysis did not involve site specific proposals. Locations of berthing facilities, tank farms etc. could not be pinpointed. However, impacts were quantified, to as great an extent as possible, as a function of distance from major noise sources.

74 Existing risks from cargo vessels, tank barges, recreational vessels, tugs, etc., have been included in the risk analyses.

75 Potential impacts from oil spills are discussed in the sections dealing with the various environmental components. In some instances the potential impacts are quantified; however, many potential impacts from oil spills would be qualitative in their very nature.

76 Potential impacts to potable water and energy supplies are quantified to the extent that data was available and the potential impacts were determined to be significant.

77 Consistancy with Shoreline Master Program ordinances is considered for the port alternatives discussed in Chapter 9 of the FES.

78 The Low Point site has been discussed in much more detail in the FES. Refer in particular to the sections on the Trans Mountain proposal in Chapters 1 and 8.

79 The Cross Puget Sound route segment is now the proposed route of the NTPC. Discussion of this route segment and evaluation of potential environmental impacts along it have been moved from Chapter 8 of the DES into the various sections of Chapters 1 through 7 of the FES. These comments were considered when revisions were made to implement this change. The route proposed by TMC would also cross Puget Sound and Whidbey Island. Potential impacts from that proposal are discussed in the TMC section of Chapter 8 of the FES.

80 Refer to the Response to Comment 22-1.

81 Discussion and environmental impact analysis of the Jackass Ridge route segment has been incorporated into various sections of Chapters 1 through 7 of the FES. The FES contains a new section in Chapter 3 with a revised discussion of pipeline oil spill risk analysis. Refer to the Responses to Comments 86-9 and 86-68.

82 Refer to the Response to Comment 51-6.

83 The section on the TMC proposal in Chapter 8 of the FES addresses these issues to the greatest extent possible. Refer to the Responses to Comment 86-11 regarding secondary impacts.

84 The section on the NEC proposal in Chapter 8 of the FES addresses these issues to the greatest extent possible.

**87**

1 As indicated in the FES, the NTPC electrical load requirements would be relatively insignificant in terms of regional power supplies, and would not be expected to lead to development of additional generating facilities in Montana.

2 The ES addresses the potential impacts of the NTPC system as designed and proposed by NTPC. Chapter 9 of the FES considers several additional route segment alternatives to the NTPC proposal which were not considered in the DES. Some of those route segments alternatives would follow existing corridors.

3 The precise pipeline alignment within the 2-mile wide study corridor would not be determined unless the NTPC proposal was approved. If that happens, NTPC would be responsible for obtaining all necessary non-federal permits and for implementing its proposal in conformance with all applicable regulations and permit stipulations. If the NTPC proposal is approved and implemented NTPC would carry out detailed ground surveys to determine the precise alignment and would obtain easements from private land owners. Specific conditions at particular places and specific permit stipulations would be considered at that time.

4 Through western Montana, the potential for seismic-induced damage is much the same for the primary and alternate routes. However, NTPC is committed to the necessary engineering design features to accommodate this risk.

5 As stated in the FES, the construction and operation of the proposed pipeline system would probably have a negative affect on the perceptions of the aesthetic setting by local residents. However, this has not been identified as a significant adverse impact.

6 Redistribution of these domestic crude oil supplies is considered to merely shift the location of any deficiency. Reallocation of domestic supplies is briefly discussed in the section on Other Alternatives in Chapter 9 of the FES.

**87** CONT

7 The Title V proposal from Northwest Energy Company (Foothills) which proposes the use of Skagway as a marine terminal is discussed in Chapters 1 and 8 in much greater detail than was included in the DES. The alternatives for the NEC proposal are discussed in Chapter 9.

8 Reduced Alaskan oil flow, retrofiting west coast refineries and swaps with Japan have been considered in the section on Other Alternatives in Chapter 9 of the FES.

**88**

1 Refer to the Response to Comment 58-1.

**89**

1 The description of the Northwest Energy Company (Foothills) proposal and the evaluation of potential impacts is presented in substantially greater detail in Chapters 1 and 8 of the FES. The estimated cost of the proposed project is presented in the subsection on NWE Project Cost Estimate in Chapter 1.

2 To the extent possible with available data, the risks of oil spills in Lynn Canal and the potential impacts from spills are discussed in the NEC section of Chapter 8.

3 The NEC project, as currently proposed, is described in the section on NWE in Chapter 1 of the FES.

4 The NEC proposal, and the various proposed alternatives to it, are described in Chapter 1 of the FES in more detail than was presented in the DES. Chapters 2 through 7, evaluating the environmental impacts of the NTPC proposal, have been revised and Chapter 8 contains the analyses of the other 3 proposals. Chapter 9 presents other alternatives.

5 This issue is discussed in the sections in Chapter 8 on Topography and Geology for the NEC proposal.

**90**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 90 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**91**

1 Pipeline System Oil Spill Risk Analysis is discussed in a new section of Chapter 3 of the FES. Pipeline System Geologic Hazards are discussed in the sections on Topography and Geology in Chapters 2 and 3. Throughout the ES, the effects of construction and operation of the pipeline are discussed in terms of potential impacts on the various resources, with the locations of specific significant and critical impacts identified in the Map Addendum. Potential impacts resulting from oil spills and leaks are discussed in the various sections in Chapter 3 which deal with specific resources.

2 Refer to the Response to Comment 51-6.

3 The risk of a pipeline oil spill is discussed in Chapter 3 of the ES. Economic losses due to an oil spill would be recoverable from the parties responsible for the spill.

4 Refer to the Response to Comment 82A-2.

**92**

1 Conservation has been discussed in the section on Other Alternatives in Chapter 9 of the FES.

2 A refinery has been proposed at Moses Lake (Grant County, WA) as discussed in the revised text of the section on Pipeline System Economic Conditions in Chapter 3. No additional petroleum-related industry in the port area is likely as a result of the project. An assured supply of crude petroleum to the inland market area would permit normal industrial growth which might otherwise be inhibited by crude oil deficiencies.

**93**

1 The description of the NTPC proposal in Chapter 2 of the ES is presented in sufficient detail for environmental impact analysis.

2 Research to date is beginning to identify cumulative effects. However, many results are from laboratory experiments under controlled conditions and under given crude oil concentrations. Such research results do not conform to "real world" conditions in which crude oil is dispersed, diluted, and weathered. The only ways to reduce the frequency of minor spills are with personnel training and with improvements of oil transfer technology.

3 The EPA would require NTPC to utilize low-sulfur fuel for tankers in port as a stipulation in their construction permit. Prior to approval being granted, NTPC would have to demonstrate to the satisfaction of the EPA that they would utilize best available control technology and that they would not exceed the Prevention of Significant Deterioration increments.

The use of low-sulfur fuel in port would necessitate segregated fuel tanks on tankers. Most tankers could adapt to the requirement. Low-sulfur fuel would be brought by tanker ships from California. Once the project is in operation, enforcement of the stipulation would be the responsibility of either the EPA or the Washington State Department of Ecology.

4 These measures have been deleted from the FES; however, where appropriate, they have been included with the project design, construction or operation descriptions in Chapter 1. The discussions of potential impacts in Chapter

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CONT

3 take those measures into account. Those measures which were not applicant committed and which might mitigate impacts are found in Chapter 4 of the FES.

5 The BLM has consulted with the National Oceanic and Atmospheric Administrations National Marine Fisheries Service throughout the preparation of the FES. Refer to the sections of Chapter 10 on Data Collection and on Consultation Required by Statute for details about information obtained and consultation required by Section 7 (c) of the Endangered Species Act.

6 In the FES the opinions of opponents to the proposed action are discussed in the Social Conditions sections of Chapters 2 and 3. The unreferenced speculations concerning industrial diversification have been deleted from the Social Conditions sections of the FES.

7 The absence of baseline data made it impossible to make a definite determination regarding impacts on air quality values in the Olympic National Park. Data are now being collected by NTPC, but they probably will not be available before the FES goes to the printer. Additional information is expected to be available for consideration during the decision making process.

Modeling of existing pollution sources in Port Angeles indicates an average annual sulfur dioxide concentration at the Olympic National Park headquarters of about 5 ug/m$^3$. The expected increment due to the proposed tanker facilities is about 0.5 ug/m$^3$. This represents only a 10 percent increase. At Lake Dawn the calculated annual average sulfur dioxide concentrations from Port Angeles sources is less than 1 ug/m$^3$. The projected increment there is calculated to be much less than 0.5 ug/m$^3$.

Short-term effects are more difficult to evaluate because of lack of meteorological data. Modeling indicates that existing sulfur dioxide concentrations at the Park Headquarters can reach about 45 ug/m$^3$ for the 24-hour average. The maximum increment from tanker emissions was 7.5 ug/m$^3$, or about 17 percent increase above background. However, existing and proposed emissions would not necessarily be additive. The particular wind direction that could cause high concentrations at the Park Headquarters from existing emissions, may cause little or no contribution from the tankers. It is evident that the potential for significant cumulative inter action between proposed and existing sources would be small. However, because of the limitations in the existing data and the modeling, a definite determination can only be made when actual onsite air quality data have been obtained and analyzed.

8 Frequency of oil spill magnitudes have been presented in the FES. Also existing risks, incremental risks, and combined risks have been discussed. Cumulative effects are difficult to assess in that most research results are from controlled experimentation. Such results do not represent "real world" conditions.

9 More detailed information has been provided in the section on Port Economic Conditions in Chapter 3.

10 The analyses of potential impacts from the NTPC project, which are presented in Chapter 3, are based on the current proposal from NTPC. The expected increases in tanker traffic in Port Angeles Harbor were considered as components of the proposed action which would potentially affect a number of environmental values.

11 The text of the section on Port-Economic Conditions in Chapter 3 has been revised to correspond with the final report by the Oceanographic Institute of Washington (1979) on risk analyses. Also refer to the new sections in Chapter 3 on Oil Spill, Fire and Explosion Risk Analyses.

12 Refer to the Response to Comment 34-35.

13 Refer to the Response to Comment 79-1.

**94**

1 The table on Governmental Agencies Having Project Approval Requirements in Chapter 1 of the FES has been revised to include these additional permitting responsibilities of Mn/DOT. If the NTPC proposal is approved it would be the responsibility of NTPC to obtain the required permits from Mn/DOT.

2 These corrections have been recorded. However, the tables on the pages cited in the Comment have been deleted from the FES.

3 See the Response to Comment 94-1.

4 The concern about possible conflicts between the proposed pipeline and the Crookston Airport expansion project is noted. A more detailed analysis of the possible conflict cannot be done unless the NTPC proposal is approved and until the actual pipeline right-of-way is determined. The section on Airways in chapter 3, under Pipeline System Transportation and Utilities has been revised to discuss potential impacts during construction.

**95**

1 The Introduction to the FES includes a revised discussion of projected Demand and Supply, which is based on information from an independent study by the U.S. Department of Energy (1979).

2 Reduction of the west coast surplus of crude oil is a part of the purpose of the proposed projects. The reason for that goal is to develop a more economical means of transporting the surplus, not to completely eliminate the surplus. Consider that the surplus is currently being carried by tanker through the Panama Canal and around Cape Horn. The prospective size of the surplus is significant to a determination of an economical transportation system, but the possible future existence of a surplus in excess of what the system might carry would not reduce the value of the system in reducing the surplus. Any remaining surplus would be handled by the most economical available means. The purpose of the ES is to evaluate the potential environmental impacts of the construction and

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**CONT**

operation of the proposed crude oil transportation systems. The information presented in the FES has been determined adequate to accomplish the environmental analysis.

3 The existence of contractual agreements for crude oil transportation is not considered necessary to the environmental statement. Their existence would have a bearing on the financial feasibility of the project which will be examined by the Department of Energy in separate studies.

4 Reallocation of crude oil supplies within the states of Montana and Wyoming has been considered in the section on Other Alternatives in Chapter 9 of the FES.

5 Reduced Alaskan oil flow, retrofitting west coast refineries and swaps with Japan have been considered in the section on Other Alternatives in Chapter 9 of the FES.

6 The Montana Major Facilities Siting Act applies to certain generation facilities and to pipelines to such facilities. It does not apply to pipelines to refineries, hence it does not apply to the NTPC proposal and is not mentioned in the ES.

7 In the FES, a discussion of the way of life of rural residents has been included in the Social Conditions sections of Chapters 2 and 3. Negative affects would occur, but there would be no significant adverse impacts.

8 More detailed estimates of tax revenues were not considered necessary. Comparison of the indicated increase in property tax with the existing tax collections shown in Chapter 2 conveys an impression of the extent to which the local property tax base would be affected in the first year or two of operation. In subsequent years, pipeline property would be assessed on the basis of its income value. Tax levies for taxing jurisdictions affected by the increased tax base would vary from existing levels by an indeterminate amount depending on the amount of increase in the tax base, and future revenue needs.

9 Refer to the Response to Comment 34-35.

10 A discussion of impacts to ground water resources is included in the section on Pipeline System Aquatic Resources in Chapter 3.

11 Refer to the Response to Comment 34-16 for a discussion of leak detection systems. NTPC's draft Contingency Plan is discussed in Chapter 1. The final contingency plan would not be prepared unless the proposal is approved. As stated in Chapter 1, it would have to be reviewed and approved by affected government agencies prior to beginning operation of the system.

12 There should be no significant impacts resulting from test water discharges since the quality of discharge water would be regulated according to state or federal water quality standards with NPDES permits.

13 Private and public landowners retain property rights (subject to easement restrictions) along the length of the pipeline corridor. Public access on the pipeline corridor would be subject to local, state, and federal laws.

14 Refer to the Response to Comment 34-7 for an explanation of the right-of-way width issue. The section on Pipeline System Transportation and Utilities in Chapter 3 discusses potential impacts of future corridor use in general terms. A more specific discussion would be conjectural at this time.

15 Refer to the Response to Comment 87-1 and to the section on Pipeline System Transportation and Utilities in Chapter 3.

**98**

1 Retrofitting west coast refineries has been considered in the section on Other Alternatives in Chapter 9 of the FES.

2 It would be reasonable to assume that if a pipeline project is approved, the pipeline company would apply to the various states for the right of eminent domain. Whether or not such application would be approved would be a matter for decision by the state. Presumably it would be extremely difficult for a pipeline company to successfully complete construction without the right of eminent domain.

3 Refer to the Response to Comment 51-10.

4 Chapter 9 of the FES, in the section on route segment alternatives to the NTPC proposal, presents discussions of several alternative routes. Chapters 8 and 9 present discussions of several alternative systems to the NTPC proposal

**99**

1 The City of Port Angeles/ Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issued rated in Comment Letter 99 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**101**

1 The need for the proposed transportation route is described in the statement. An analysis of the benefits and costs of the several projects, being prepared by the Department of Energy, will show whether or not the projects are economically justifiable. The most crucial test of economic justification will be made by investors in deciding the likelihood of a profit on their investment in competition with other transportation routes. Pipeline throughput volumes beyond the minimums represented by the estimates of physical shortages would be determined by the extent to which the pipeline could deliver supplies more cheaply than other routes. The Department of Energy has been requested to estimate throughputs based on competitive conditions. Refer to the Response to Comment 69-5 and the Introduction to the FES concerning the ability of mid-west refineries to use Alaskan oil.

**101 CONT.**

2 The immediate and long term effects on salmon spawning areas have been addressed in the revision of the section on Pipeline System Aquatic Resources in Chapter 3. The draft Oil Spill Contingency Plan prepared by NTPC is discussed in Chapter 1

3 The details of pipeline construction in specific areas would not be determined until NTPC developed detailed construction designs, which would be done only if the proposal is approved and NTPC decides to proceed with construction. The North Bend storage facility is not part of the NTPC proposal. The potential impacts of that facility were mentioned briefly in section 6.3 of the DES. Since publication of the DES, NTPC has changed its route proposal to across Puget Sound. The new route proposal would eliminate the need for a North Bend storage facility if a connection to the Puget Sound refineries were ever built.

4 At this time the NTPC project is a proposal only. The precise alignment of the pipeline within the 2-mile wide study corridor will not be determined unless the project is approved and implemented. If that occurs, it would be the responsibility of NTPC to obtain easements from all individual landowners. It would be the responsibility of the landowners to address their specific interests to NTPC at that time.

**103**

1 The systems and procedures for leak detection which have been proposed by NTPC are described in Chapter 1. Also refer to the Response to Comment 34-16 for an additional discussion of leak detection. A new section in Chapter 3 of the FES presents a revised discussion of the oil spill risk analysis for the pipeline system, and the draft Oil Spill Contingency Plan which NTPC has prepared is discussed in Chapter 1.

**106**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 106 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**107**

1 NTPC has committed itself to completely revegetate all disturbed areas. Exact methods would vary according to local conditions and requirements by land owners as articulated in easements and permit stipulations. The potential impact on land owners from the imposition of eminent domain is discussed in the section on Pipeline System Social Conditions in Chapter 3. Since NTPC proposes to transport a variety of crude oils, not just Alaskan crude, the discussions of potential impacts from oil spills on leaks are not differentiated in terms of different types of crude. The discussions of alternatives in Chapter 8 and 9 of the FES are substantially expanded in comparison with the DES. Projected supply and demand is discussed in the Introduction to the FES, and project cost and operating cost estimates for the several proposals are discussed in Chapter 1 of the FES. Refer to the Response to Comment 95-8 concerning tax issues. Refer to the Response to Comment 34-7 concerning right-of-way width and the Minerals Leasing Act.

2 The cited publication was referred to during preparation of the ES; however, much of it is too general to be specifically applicable to the pipeline corridor. In addition, the Forest Service made a rather detailed, on the ground assessment of the proposed route alignment across the Prospect Creek Planning District for BLM. The information from that assessment was incorporated into the DES and the FES. While all faults have potential for movement, only those which have shown apparent movement during the past 3 million years are considered to be potential geologic hazards. The 5 existing faults mentioned in the Forest Service publication have apparently not been active and are not considered to represent a significant threat to the pipeline. Areas of slope instability and with critical soil erosion problems are identified on the Alignment Sheets in the Map Addendum. Potential impacts on Aquatic Resources, Wildlife, Vegetation and people are discussed in the appropriate sections of Chapter 3. If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. Presumably at that time the State of Montana would ensure compliance with its flood plain law.

**112**

1 Refer to the Introduction to the FES for a discussion of the procedures under which the ES has been prepared and which will be followed in the public review of the FES. Specific responses to the comments in this letter have not been prepared since the ES is not an appropriate place to discuss interpretation of the laws or to discuss the nature of the role of the ES writers.

**113** **A**

1 These remarks were received separately and recorded as Comment 43. Refer to the responses to Comments 43-1 through 43-7.

**B**

1 The appropriate places in the FES have been corrected on the basis of this information.

2 Refer to the Responses to Comments 43-2 and 51-10.

**113**
**CONT**

3 NTPC has prepared a draft Oil Spill Contingency Plan which is discussed in Chapter 1. Detailed measures for compensation of losses to fish and wildlife have not been provided by NTPC. If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary state permits. At that time the states would have the opportunity to establish specific mitigation and/or compensation requirements for NTPC project actions under their jurisdictions.

4 Refer to Chapter 1 and the Response to Comment 34-16 for discussions of leak detection systems and procedures. The discussion of potential impacts from oil spills in the section on Pipeline System Aquatic Resources applies to undetected spills in small tributary streams.

5 The route segment alternative along the South Fork of the Coeur d' Alene River has been discussed in Chapter 9 of the FES.

6 At this time we do not have adequate information to determine losses of the relatively few species which would be dependent on the forage and shrub growth on the right-of-way. The concept of abandonment causing short-term losses from habitat alteration and limited long-term losses is included in the section on Pipeline System Wildlife in Chapter 3.

**C**

1 Refer to the Response to Comment 113B-5.

2 It is likely that each river crossing will require a permit. Concerns such as the ones identified in this comment could be dealt with by including appropriate conditions in those permits.

3 The section on Pipeline System Aquatic Resources in Chapter 3 has been revised to include impacts of downstream deposition of sediment. Since discharges would be regulated by NPDES permits, no significant impacts should occur. If discharges meet the conditions of the NPDES permits, they would be considered acceptable.

4 Refer to the Response to Comment 34-19

5 Refer to Chapter 1 and the Response to Comment 34-16 for discussions of leak detection systems and procedures.

6 These specific measures have not been added to Chapter 4. Chapter 4 has been revised and it explains BLM procedures for handling mitigation measures in this ES.

**D**

1 Refer to the Response to Comment 34-16.

2 The major portion of artificially produced salmon come from facilities in western Washington. It is recognized that a portion does come from Idaho; however, since no production facilities in Idaho would be affected by the proposed NTPC project, they were not specifically mentioned in the ES.

3 The table has been revised to include this information.

4 The figure has been corrected.

**114**

1 NTPC's Cross-Sound route proposal has been incorporated into Chapter 1 of the FES, and related environmental issues have been addressed in the appropriate sections of Chapters 2 through 7. The oil spill risk analyses, discussed in new sections in Chapter 3 of the FES, included consideration of the Cross-Sound route. Except in Chapter 6, the environmental analyses are based on a maximum throughput of 933,000 bpd, as proposed by NTPC. If the NTPC project is approved and constructed, and if the existing Puget Sound refineries are required to hook up with the NTP, the construction of the new facilities that would be required to carry the additional throughput would be a new project requiring a separate ES.

2 The Kitimat, Northwest Energy (Foothills), and Trans Mountain proposals are presented and analyzed in Chapters 1 and 8 of the FES, in considerably more detail than in the DES. The decision to treat Canadian resources in relatively less detail is based on Executive Order 12114, as discussed in the Introduction to the FES. Refer to the Introduction for an explanation of opportunities for public review of and comment on this FES.

3 Net energy analyses for the Northern Tier and Northwest Energy proposals are reported in the statement. These analyses show that energy consumption is small compared with the energy delivered; however, operating energy requirements may affect local energy resources as described in the statement. Comparative information is included for other proposals and alternatives.

4 The findings of this study have been incorporated into the discussion of Projected Demand and Supply in the Introduction to the FES.

5 Information from the publication referred to in the comment has been included in the FES.

6 NTPC's proposed project would provide economic benefits to the area through taxes, jobs and more business of some kinds. However, as stated in the DES, many people do not perceive these economic benefits to compensate for the possible risks and environmental degradation. This is not an inconsistency, merely a contrast of public views on the proposed project.

7 The NTPC proposal described in Chapter 1 is that presented to BLM by NTPC. If the project is authorized the specific design, burial requirements and operating procedures for the submarine pipe-

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**CONT.**

line would be determined during advanced engineering studies and would be subject to regulation by the U.S. Coast Guard and Army Corps of Engineers.

8 Refer to Chapter 1 and the Response to Comment 34-16 for discussions of leak detection systems and procedures.

9 Streams identified in Chapter 1 of the DES were selected on the basis of physical parameters. The cited table has been deleted from Chapter 1 of the FES. Criteria for including specific streams in the tables in the sections on Aquatic Resources in Chapters 2 and 3 are explained in the FES. Also, refer to the Response to Comment 76-10. Streams which support significant fishery values are identified in the subsections on Biological Components in the Pipeline System Aquatic Resources sections of Chapters 2 and 3.

10 Information from the NOAA-MESA report has been included in the FES.

11 The sections on Biological Components of Marine Resources were completely rewritten for the FES. These comments were considered during the rewriting.

12 The FES contains new sections on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3. Assessments of potential oil spill impacts on marine resources have been revised; however, quantified impacts of a case such as the one described in the comment have not been included.

13 The cited section on Recreation has been substantially revised for the FES so that this comment is no longer specifically applicable to that section. Refer to the Response to Comment 76-19.

14 Several aspects of responsibility for payment of oil spill clean up costs are discussed in the section on Port-Economic Conditions in Chapter 3. Responsibility for clean up operations normally rests with the party responsible for the spill. The extent of clean up operations would not affect liability for any damages which might occur. Ship companies and pipelines have liability insurance for the hazards mentioned. While such insurance may not provide full coverage for all possible risks, bonding is not considered a practical solution of the problem. In the event of a spill, the responsible party would be liable for all resulting damages.

15 A mix or combination of alternatives to accomplish the purpose of the proposed action has been discussed in the section on Other Alternatives in Chapter 9 of the FES.

**115**

1 The text has been reviewed and it has been determined that the information provided is sufficient. If the NTPC proposal is approved, then detailed studies of specific areas would be carried out by, for example, NTPC while doing field surveys to determine the precise pipeline alignment within the approved corridor, and the Corps of Engineers in evaluating requests from NTPC for specific stream crossing permits.

2 The width of the easement for the Trans-Alaska pipeline was limited by the Mineral Leasing Act of 1920, under which the right-of-way across the Federal land was granted. The actual width required for construction, however, generally varied from 100 to 300 feet. Based on the Alaska experience, the ES Team has estimated that an average width of about 100' would be disturbed in constructing the Northern Tier pipeline. Refer to the Response to Comment 34-7 for additional discussion of this issue.

3 Retrofitting west coast refineries has been considered in the section on Other Alternatives in Chapter 9 of the FES.

4 The Driveway Ridge route segment alternative has been included in Chapter 9 of the FES.

5 Refer to the Response to Comment 95-7.

**116**

1 Details about Northern Tier's proposed pump station locations and facilities are included in the NTPC Project description in Chapter 1. In addition pump station locations are shown on the Alignment Sheets in the Map Addendum. The figure in Chapter 1 illustrating a typical pump station has been revised to include proposed dimensions of the facilities.

2 At this time the NTPC project is a proposal only. The precise alignment of the pipeline within the 2-mile wide study corridor will not be determined unless the project is approved and implemented. If that occurs, NTPC would have to obtain right-of-way easements from all individual landowners. It would be the responsibility of the landowners to address their specific concerns to NTPC at that time.

3 The soils mentioned should present no special problems that cannot be handled satisfactorily with ordinary construction techniques or mitigation measures. Soil characteristics, including slope stability, rehabilitation factors and maintenance are provided in the Map Addendum.

4 The discussion of impacts on social well-being and quality of life has been revised to include consideration of rural lifestyles and concerns. Interrelationships with other Department of the Interior projects are discussed in the section on Interrelationships in Chapter

5 The section on Pipeline System Topography/Geology in Chapter 2 has been revised to include this information.

6 To our knowledge, there is no provision for bonding to protect affected private property. NTPC has not proposed and State laws do not require bonding for this purpose. For these reasons it is not mentioned in the ES.

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**CONT**

7 The possibility of impacts from oil spills occurring distant from the immediate area of the spill is recognized and discussed in several sections of Chapter 3. Also, refer to the response to Comment 82A-2.

**118**

1 If the NTPC project is approved and implemented, NTPC would have to obtain easements from all individual landowners. It would be the responsibility of the landowners to address their concerns to NTPC at that time. NTPC has indicated that it would restore all disturbed areas.

2 NTPC has indicated that the pipeline would be buried a minimum of 3 feet below the surface, or at whatever depth necessary to be below the local plow zone. If the proposed NTPC project is approved and constructed, it can be assumed that when NTPC does detailed ground surveys, inquiries about depth of plowing would be made and construction specifications would be adjusted accordingly.

**119**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 119 were adequately addressed in the comments received from the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**120**

## GENERAL RESPONSE TO COMMENT LETTER 120

The NTPC project proposal, as presented in Chapter 1, has been designed by NTPC and provided to BLM as a part of NTPC's application for a right-of-way permit and for selection under Title V (see the Introduction to the FES). It is a design proposal only; detailed project designs, the precise alignment of the pipeline within the 2-mile wide study corridor, and other site specific details will not be determined unless the NTPC proposal is approved and implemented. Many specific questions contained in Comment Letter 120 deal with design and related issues that can only be answered by NTPC, and probably not until some later stage in project design development. In addition, a number of specific comments referring to Chapter 1 material actually pertain to impact analysis issues which are discussed in Chapter 3.

The mitigation measures proposed by NTPC which were listed in Chapter 1 of the DES and discussed in Chapter 4 have been included with descriptions of the project design, or construction or operation procedures in Chapter 1 of the FES. The evaluation of potential impacts in Chapter 3 is based on the project proposal including these mitigation elements. Specific mitigation measures suggested by the authors of Comment Letter 120 have not been incorporated into Chapter 4 of the FES. The introduction to that chapter explains the procedure regarding mitigation measures which were followed by BLM in preparation of the FES.

If the NTPC proposal is approved by the DOI, NTPC would be responsible for obtaining all other required federal permits and all necessary non-federal permits. In addition, NPTC would have to obtain easements from all individual landowners. If the NTPC proposal ever reaches this stage the various permitting authorities and landowners would have the opportunity and responsibility to address their specific concerns to NTPC. In this instance, the various federal and non-federal agencies would be responsible for the monitoring and enforcing the activities and/or areas under their jurisdictions. Landowners would be responsible for monitoring any specific provisions in their easements with NTPC. With this ES, BLM is involved in the DOI permitting process and the Title V selection procedure. BLM does not have a role in the other permitting actions or in the process of obtaining easements.

Finally, it should be noted that most of the items in Comment Letter 120 pertain to areas along what was called the Ninemile-Helmville route segment alternative in the DES. Route segment alternatives were discussed in Chapter 8 of the DES. The Ninemile-Helmville route (with some more recent modifications) is now the proposed route of NTPC and the description and analysis of it have been incorporated into Chapters 1 through 7 of the FES. When those chapters of the FES were revised and rewritten to incorporate the material from Chapter 8 of the DES, these and other comments were also considered.

1 Additional estimates of demand and supply are presented in the Introduction to the FES. Presentation of the demographic and economic projections on which they are based is not considered essential to the purpose of showing the opinions of several authorities.

The Canadian National Energy Board has recommended the continued export of light crude through 1981, and 107,000-117,000 bpd of heavy crude in 1979. Accordingly, the availability of Canadian supplies is not assumed beyond 1981. For projected oil production by region, see Chapter 3 of the draft Report by the U.S. Department of Energy (1979). Estimated shortfalls are based on the difference between the projected supply and demand after allowance for adjustment of deficiencies through existing oil transportation systems.

2 Refer to the General Response to this comment letter, except as noted below:

Item 2a - Refer to the Response to Comment 34-7.
Item 2b - Refer to the section on Pipeline System Aquatic Resources in Chapter 3 and to the Response to Comment 43-2.

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**CONT.**

3 The section on Pipeline System Climate in Chapter 2 of the FES has been revised to include this information.

4 Refer to the General Response to this Comment Letter.

5 The applicant is committed to mitigate erosion impacts. Stream crossings should not alter original stream gradients to the extent that severe erosional areas would occur.

6 Bald eagle and peregrine falcon habitat are discussed in the FES.

7 All creeks and valleys along NTPC's proposed route are described because of the immense area involved. Ninemile is described and discussed in detail and this is considered representative of the wildlife resources occurring in the surrounding drainage. Prime elk and deer wintering areas are discussed in the FES.

8 The FES has been revised to include discussion of the current NTPC route proposal in Chapters 1 through 7. Refer to Chapter 4 for a brief explanation of the proposed means for accomplishing any cultural resource management activities which may be required.

9 Refer to paragraph 4 of the General Response to Comment Letter 120.

10 The table has been revised to make it consistent with the current proposal from NTPC.

11 Frenchtown has been included in the table in the FES.

12 The section on Pipeline System Land Use in Chapter 2 identifies areas which have been designated or proposed as significant national areas. Refer to the section on Terrestrial Vegetation in Chapter 2 for a discussion of any rare, threatened or endangered plant species that occur along the proposed route.

13 This is a subjective opinion. Contact with the Ninemile Creek ranger station confirmed that light, local use was occurring. Local property owners and residents may fish Ninemile Creek frequently, but the use is not considered extensive in the context of the areas covered by this ES.

14 The number of camper spaces along the pipeline route are included in the table on Community Resources for Counties in the section on Pipeline System Social Conditions in Chapter 3.

15 Refer to the Responses to Comments 8-3 and 120-14. The experience along the Alaska pipeline is not considered particularly relevant because of the great differences in numbers of available housing units in towns and cities along the routes. Another illustration of the difference can be seen in the fact that NTPC does not anticipate the need for any construction camps.

16 Strains on police protection facilities may occur, but because of the relatively brief period during which construction workers would reside in any area, no significant adverse impacts are anticipated. Analysis of extensive social research data indicate that no significant adverse impacts would occur on social well-being and quality of life indicators.

17 It was determined that a study of this type was not necessary for adequate identification of potential impacts.

18 The table is not meaningless. It shows the probabilities for electric utility companies not being able to meet firm energy loads for the various time periods shown. For example, in 1985-86 there is a 4.1% probability (4.1 chances out of 100) that the utility companies will not be able to supply the energy loads required by their firm load customers. Between the periods of 1978-79 and 1985-86 there is a 55.5% probability that the utilities would not be able to meet firm load requirements.

19 The fugitive dust emissions given in the table in the section on Pipeline System Air Quality in Chapter 3 include sources from unpaved roads.

20 Summary impacts to the geologic material are low. Potential impacts to the physical geology (e.g., geologic hazards) could be significant and have been identified. Mitigation of impacts to small drainages would be at the discretion of the landowner. Refer to paragraph 3 of the General Response.

21 The concerns identified in this paragraph were considered in the revision of the section on Pipeline System Topography/Geology in Chapter 3.

22 This alternate route is now a part of the proposed route. NTPC is committed to run liquefaction and other geotechnical studies in seismicity active areas. Potentially significant slope instability was identified near Siegel Mountain (Siegel Pass) and mentioned in the DES. Potential slope instability near Frenchtown has been included in the revision of the section on Pipeline System Topography/Geology of Chapter 3.

23 The section on Pipeline System Topography/Geology in Chapter 3 has been revised to include mention of the problem identified in paragraph one of the comment. As the final location of the pipeline within the two-mile corridor has not been made, no site specific impacts can be addressed. Disposal of reject rock material would be at the discretion of the landowner.

24 Page 2-116 of the DES reads as follows:

> Man-made intrusions include an overhead power transmission line and the swath cleared for it; the cuts, fills, and clearings for highways; pipelines and powerlines for the Coeur d'Alene, Prospect Creek, and Prichard Creek drainages; and erosion and scars created by their installation and maintenance.

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**CONT.**

This describes what has happened in the past. Nothing is know about past mitigation efforts by highway contractors or pipeline and powerline companies. Erosion losses would still be normal, providing the mitigating measures proposed by NTPC are carried out. Chapter 3 of the DES and the FES correctly states that "Erosion losses would be normal after vegetation was fully established." This is a safe assumption.

25 The section on Pipeline System Aquatic Resources in Chapter 3 has been revised to reflect groundwater flow concerns. Refer to the section of Chapter 3 mentioned above and to the Response to Comment 51-10 for discussions of hydrostatic testing.

26 The table on Maximum Potential Oil Spills in the section on Pipeline System Aquatic Resources in Chapter 3 includes information about only those relatively large streams for which NTPC has provided valve placement data. Comparable data was not available for the smaller streams along the Ninemile Valley; therefore, they have not been added to the table.

27 Refer to the section on Pipeline System Aquatic Resources in Chapter 3 and to the Response to Comment 51-10.

28 Site specific studies were not done for the reasons mentioned in paragraph 1 of the General Response to Comment 120 and becuse it was determined that they were not necessary to an adequate identification of potential impacts.

29 Right-of-way clearing and cleanup methods proposed by NTPC are discussed in the section of Chapter 1 which describes the NTPC proposal. Assuming a clean right-of-way and stabilized, non-eroding backfill over the pipeline trench, an increase in shrubs and herbaceous plants on utility rights-of-way is a common experience. Locally reduced competition for light, nutrients and water provides good habitat for opportunistic plants. This is the reason right-of-way revegetation and maintenance programs must be planned.

30 The discussion on this subject has been expanded. Also refer to the Reponse to Comment 34-28.

31 The section on Pipeline System Terrestrial Wildlife in Chapter 3 has been revised to include this concern.

32 The cited statement was deleted when the section discussing potential impacts on visual resources was revised.

33 The support facilities mentioned are considered in other sections; however, detailed information is not available as to the number and locations of such facilities and therefore the impacts can only be described in a general way.

34 The potential impacts from block valve sites are discussed in other sections of Chapter 3. In particular, refer to the Land Use section. For a number of environmental components the block valve sites would not be a significant operation phase impact.

35 The reference is to the Land Use summary and introduction part of the DES. Spoils disposal is discussed in more detail in the FES. Revegetation of spoils material is discussed in the soils and vegetation sections of the DES and the FES.

36 In the FES all sections consider the variable right-of-way width indicated in this section of the DES. See the introduction to Chapter 3 of the FES. The text preceeding this table in the DES and in the FES states that allowance for access roads are included. The text of the FES has been revised to reflect consideration of the comment about losses of agricultural production.

37 Refer to the Chapter 1 description of the NTPC proposal and to the Responses to Comments 120-30 and 34-28.

38 The table reference has been corrected in the FES. The wilderness sections have been revised in the FES. However, as indicated in the general response, the impacts are assessed based on the NTPC proposal, which, at the time of the DES was prepared, would have affected several areas under study for wilderness values.

39 Refer to the Response to Comment 64-1.

40 The assumption is appropriate. In most areas access could be obtained along the right-of-way. Steeply incised drainages perpendicular to the right-of-way would present the usual situation where a temporary access road off of the right-of-way would be required. Such roads would generally be less than one mile in length.

41 A separate federal ES would probably not be required, although state environmental reports might be required in some instances.

42 The discussion of impacts in the section on Transportation and Utilities refers to potential impacts to communication systems, not to the potential impacts on other resources, such as discussed in the section on Pipeline System Visual Resources. The cathodic protection system proposed by NTPC is described in the NTPC section of Chapter 1. Also, refer to the Response to Comment 15D-2.

43 It is anticipated that any construction workers not living in urban housing would use campgrounds with RV hookups. Some impacts from their continued presence for the length of the construction period could occur. No significant impacts on tent camp areas would be expected.

44 Refer to the Response to Comment 8-4.

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45 The operation of the pipeline would not entail any significant local government expenditures. Road damage might occur during construction. The amount of road damage and the responsibility for repair costs would be affected by the requirements of the road authority on the construction contractor. The economic methodology has been partially revised and is explained more fully in the section of Port Facility Economic Conditions in Chapter 3 of the FES.

46 Refer to the Response to Comment 8-4 concerning housing. References to construction workers not bringing children have been deleted from the text of the FES.

47 Fire protection at construction sites and at pipeline system facilities has historically been the responsibility of the pipeline companies. The construction of the NTPC pipeline would not be expected to have significant adverse impacts on rural fire protection services.

48 Refer to the section on Pipeline System Economic Conditions in Chapter 3 and to the Responses to Comments 120-58 and 120-80.

49 Refer to the General Response to Comment Letter 120 and to the Response to Comment 34-35.

50 After further research it has been determined that the statement referred to is accurate. Refer to the Response to Comment 51-6 for a discussion of potential impacts on groundwater from oil spills.

51 In most instances low water periods will occur within the available construction season. There may be a few streams where low water construction would not be possible. In those cases there would probably be relatively more serious impacts from sedimentation.

52 The environmental inspector would be an employee of NTPC. It is not known whether the inspector would have stop-work authority. On federal lands a compliance specialist would be employed by BLM to monitor construction for compliance with terms of the federal permits. In addition other federal agencies and state agencies may monitor construction activities carried out under their permits.

53 The potential impacts from construction in the Ninemile Valley are discussed in Chapter 3 of the FES.

54 This comment and the text referred to have been reviewed. It has been determined that the terms used in the DES and FES more accurately describe the impacts that could be anticipated.

55 This potential impact has been identified in the section on Pipeline System Recreation in Chapter 3.

56 Construction workers would cause short term population increases which could cause some strains on public services; however, in its analysis BLM has not identified any areas where the potential impacts would be critical. Potential impacts on the fiscal conditions of local governments are discussed in the revised sections on Economic Conditions in Chapter 3 of the FES. Refer to the Responses to Comments 120-58 and 120-80 concerning property values. The potential impacts of a pipeline right-of-way on individual land holdings is discussed in the section on Pipeline System Land Use in Chapter 3. The references to short term nuisance impacts have been deleted from the FES.

57 It is beyond the scope of this ES to speculate on the possible future uses of NTPC's proposed pipeline corridor. The analysis in the FES does identify the land use commitment and recognizes the possibility that additional utilities may follow portions of the NTPC route, if the NTPC project is built. Any new project which could have potentially significant impacts on federal lands or which required federal permits would require a separate ES.

58 Owners of land on the right-of-way would be reimbursed by the pipeline company for the right-of-way land value and any damages. The value of the right-of-way land would be a measure of the long-term losses resulting from the use of the property for the pipeline right-of-way. Refer to the section on Pipeline System Oil Spill Risk Analysis in Chapter 3 and to the Response to Comment 34-16 for discussions of pipeline leaks and leak detection systems. The number of days before a leak too small to be detected by automatic systems would be detected by visual observation cannot be reliably estimated.

59 Many of the impacts associated with the construction and operation of the pipeline will be short-term, that is, the impact will not extend significantly beyond the life of the pipeline.

Other impacts will be irretrievable. These are discussed in Chapter 7 of the FES.

60 Increased water temperatures caused by removal of riparian vegetation would be insignificant. This concern is addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

61 The original stream gradients probably would not be altered because of construction.

62 Refer to the section on Pipeline System Aquatic Resources in Chapter 3 and to the Response to Comment 51-10.

63 This section did not state that the seismic activity was low. It stated that the probabliity of a large magnitude seismic event (6+ Richter) in the Seismic Risk Zone 2 was relatively low. The area exhibits moderate to high seismic activity and this was stated.

64 Refer to the section on Pipeline System Soils in Chapter 3, where it is stated that "The effects of compaction on crop yields is well documented, yet there is little or no information available to measure quantitative or monetary yield losses." Relative terms such as "moderate" or "severe" must be used in lieu of quantitative information. Moderate soil compaction would be more than slight compaction and less than severe compaction, yet within tolerable limits. The source of information for the 5 percent and 10 percent reduction estimates is

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explained in this section. NTPC is committed to erosion control measures for the life of the project, and to employ environmental inspectors to insure careful topsoil segregation and replacement.

65 Streams with full water rights assigned have not been identified. Legal problems concerning this issue would have to be investigated if the NTPC proposal is approved and implemented. Up to two percent of the streams' water discharge (in cubic feet per second) would be pumped out of the stream for hydrostatic testing. Pumping would generally last from a few days to several weeks. In most cases specific monitoring agencies have not been identified. If the NTPC proposal is approved, BLM would probably be responsible for monitoring pipeline construction across federal lands, and the Corps of Engineers would probably be responsible for monitoring compliance with stream crossing permits issued by the Corps.

66 Several measures designed to protect aquatic resources have been incorporated as part of project design. Other measures are identified in Chapter 4.

67 The text has been reviewed and it has been determined that a sufficient analysis of impacts has been conducted and presented in the section on Pipeline System Aquatic Resources in Chapter 3.

68 These terms are self-explanatory. "Shortly," however, has been changed to "soon." Refer to the Response to Comment 107-1 for a statement about restoration of disturbed areas.

69 This issue is discussed in the section on Pipeline System Wildlife in Chapter 3. Late summer construction would have less impact on the various species because it would not affect them during sensitive reproductive periods.

70 Quantitative data is presented if available. If quantitative data was not available, potential impacts were determined to the extent possible without it, and data gaps were noted.

71 The permanent right-of-way proposed by NTPC would be 75 feet. NTPC has proposed a 90 foot construction right-of-way. However, for determination of potential impacts, a construction right-of-way of 100 feet (horizontal distance) has been assumed.

72 Refer to the General Response to Comment Letter 120 and to the Responses to Comments 64-1 and 120-45.

73 Refer to the discussion on campground use in the section on Pipeline System Recreation in Chapter 3. The Forest Service has indicated that construction workers would not be allowed to use existing Forest Service campgrounds.

74 Refer to the Response to Comment 120-58.

75A Refer to the Response to Comment 116-1.

75B Excavations in sensitive areas such as streams and floodplains, other than for burial of pipeline, would be avoided. All borrow pits would be graded to a gentle slope (3 to 1 or less). Adequate topsoil (12 inches) would be applied to the surface of disturbed areas and seeded with species appropriate for post construction use.

75C On completion of construction, surplus materials and debis would be removed from the site. Oily wastes would be disposed of in an approved land fill. Ponded water on the onshore storage facilities site would be processed by oil-water separators before discharge.

75D Stockpiled spoil material would be backfilled into the trench and slightly mounded to allow for settling. Natural drainage patterns would be maintained by construction of diversion ditches or levees.

75E Erosion problems would be prevented by construction of ditches, levees, or ditch blocks to deflect water from the pipeline ditch.

76 Eminent domain is a legal issue and, as such, is beyond the scope of this environmental statement (Refer to the Response to Comment 98-2). Consideration of particular concerns of rural residents is contained in the Social Conditions sections of the FES. Potential impacts on property values are addressed in the sections on Economic Conditions in Chapter 3. Also refer to the Responses to Comments 120-58 and 120-80.

77 Specific areas where significant impacts would occur have been addressed in Chapter 3. The cumulative effects of establishing a pipeline corridor which could attract other utilities has been recognized but cannot be analysed in detail since it is not known what utilities, if any, would use the corridor.

78 These concerns have been considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

79 The ES format does not lend itself to such a discussion since it is a preliminary step in the permitting and selection process. The need for independent quality control and surveillance would be determined on the basis of anticipated impacts (from the ES and other environmental studies) and implemented through the permitting process, assuming the proposal is approved (see Introduction to Chapter 4 of the FES).

80 Landowners would be paid the value of right-of-way land, determined by negotiation or arbitration, and for damages resulting from construction and/or operation of the pipeline. Property taxes would generally be lower during the life of the pipeline than they would be without the pipeline because pipeline property taxes would substantially exceed any increase in the related costs of government.

81 Refer to the General Response to Comment Letter 120.

82 Refer to the Response to Comment 51-2.

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**CONT.**

83 Refer to the Introduction to the FES for an explanation of Title V of the Public Utility Regulatory Policies Act of 1978. Under Title V, pipeline proposals were received from NTPC, NEC (Foothills), TMC and KPL. These four proposals, all of which are valid alternatives, are described in Chapter 1 of the FES, NTPC is evaluated in Chapters 2 through 7 and the other 3 in Chapter 8. The Delta Junction System Alternative is discussed in Chapter 9 of the FES.

84 Reduced Alaskan oil flow, retrofitting west coast refineries and swaps with Japan have been considered in the section on Other Alternatives in Chapter 9 of the FES.

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1 The sections on Pipeline System Topography/Geology in Chapters 2 and 3 have been revised to include this information.

2 Potentially hazardous soil and tectonic creep have not been identified along the proposed pipeline corridor in Montana. Refer to paragraph 1 of the General Response to Comment Letter 120. The potential stresses and strains of non-catastrophic geologic processes and hazards would be taken into consideration during detailed pipeline design studies, if the NTPC proposal is approved and implemented.

3 Following publication of the DES pipeline engineers and geologists were consulted about bentonite and potential problems associated with swelling clays. It was reaffirmed that swelling clays would not present a significant problem to construction or operation of the pipeline. Stockpiling and disposal of surplus materials would be subject to constraints imposed in permits or easements by surface landowners or managers.

4 The proposed pipeline would not withdraw mineral deposits from being located under the provisions of the 1872 Mining Act. If the NTPC proposal is approved, the right-of-way would be subject to prior existing rights and all landowners as well as mining claimants would be compensated. The section on Pipeline System Topography/Geology in Chapter 3 has been revised to clarify this issue.

5 The proposed route is a preliminary design. Refer to paragraph 1 of the General Response to Comment Letter 120.

6 NTPC has indicated that it would follow, as much as possible, a route alignment that would cause the least environmental damage. If the NTPC proposal is approved, the precise alignment would be subject to a variety of federal and non-federal permits as well as to other considerations of local environmental factors and private easements.

**123**

GENERAL RESPONSE TO COMMENT NUMBER 123

Comment letter 123 from the Mason Regional Planning Council contains specific comments pertaining to Mason County, Washington. Mason County would be crossed by the NTPC pipeline route alignment which goes around Puget Sound. When the DES was published, this was the proposed route of the NTPC, and it was discussed in Chapters 1 through 7 of the DES. The Cross Puget Sound alignment is now the proposed route. The Around Puget Sound Route is an alternative, and the information pertaining to it is now presented only in Chapter 9. The alignment sheets pertaining to this route segment alternative are presented in a separate section of the Map Addendum. Therefore, revisions made in response to the comments below will be found in the new location, not in the sections referred to in Comment Letter 123.

1 The impact described in this comment was identified and described in Chapter 3 of the DES, and is now in Chapter 9 of the FES.

2 Only streams supporting substantial fisheries resources have been identified and included in the FES.

3 Refer to the first paragraph of the General Response to Comment Letter 120.

4 NTPC has indicated that the pump station in Mason County would be located in Section 36 Township T-20-N Range R-4-W. The location shown in the Map Addendum has been corrected.

5 The figure showing a typical pump station has been revised in the FES to show proposed dimensions.

6 NTPC proposed that a stockpile site would be located at Shelton, which was the only site designated for Mason County. The stockpile site would probably be located near the transportation facilities used for hauling pipe and equipment, most likely the railroad. The required land would have to be leased from the land owner and the exact location would not be determined unless the NTPC proposal is approved for construction along the Around Puget Sound route segment alternative.

7 Up to 480 workers would be employed on a pipeline spread. These are the workers constructing one of the ten sections of the pipeline itself. Other work forces would be involved in constructing the pump stations and other features of the system. The pump stations are scheduled for construction over a 16-month period with a maximum of 42 workers at any particular station at one time. The stations would be built by several work forces each building several stations in serial order. In order to represent the maximum potential impacts, however, the work force at all stations was assumed to be at maximum simultaneously during a period when the pipeline work force would also be at a maximum. The 840 persons mentioned represents the sum of the maximums for individual pump stations. The section on Pipeline System Economic Conditions in Chapter 3 has been revised to clarify this issue.

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**CONT.**

8 If the NTPC proposal is approved it is likely that all stream crossings will require permits. Construction scheduling would be determined during that permitting process.

9 NTPC has indicated that it would be committed to maintenance of the right-of-way for the life of the project.

10 Refer to the Response to Comment 120-52.

11 Since publication of the DES, NTPC has submitted a draft Contingency Plan which is described in the NTPC section of Chapter 1.

12 If the NTPC proposal is approved, NTPC would be responsible for obtaining all necessary non-federal permits. At that time, non-federal entities would have the opportunity to establish specific mitigation measures for the NTPC project.

13 Refer to the Response to Comment 93-4.

14 The issue identified in the first paragraph was considered in the revision of the section on Pipeline System Topography/Geology in Chapter 3 and the section in Chapter 9 on the route segment alternative. NTPC is committed to a more detailed geotechnical study in western Washington prior to final pipeline design, if the proposal is approved. It is also committed to avoid potentially significant or critical geologic hazards (e.g., active faults) whenever possible.

15 These wetlands have been mentioned in the revised sections on vegetation in the description of the Around Puget Sound route segment alternative in Chapter 9 of the FES.

16 The information in this comment was considered in the revision of the Around Puget Sound route segment alternative in Chapter 9. Only the larger streams supporting substantial fisheries resources have been included in the discussions in the FES.

17 This information appears reasonable. The table in which the sightings are mentioned also indicates that the eagles are frequently observed along the migration route from early fall to early winter. The table mentions specific recorded sightings, not all probable occurrences.

18 Only those reservations which would be crossed by the pipeline are mentioned in Chapter 2. The Skokomish and Squaxin Island Reservations are identified in the Map Addendum.

19 NTPC proposes to provide service and planning assistance to potentially affected communities along the route. No reimbursement plans for school impacts have been proposed.

20 The observation made in this comment has been noted. The section referred to by the comment, on the Future Environment, has been deleted from the FES.

21 The Satsop project is not considered to be responsible for any population impacts which significantly affect the assessment of potential impacts from the NTPC proposal.

22 The text has been reviewed and it has been determined that the information presented is appropriate.

23 The issue identified in this paragraph was considered in the revisions for Chapter 9 of the FES.

24 The issue identified in this paragraph was considered in the revision of the section in Chapter 9 on the Around Puget Sound route segment alternative. The reference to .75 miles of damage to the pipeline pertained to the Pricky Pear fault near Helena, Montana not the Puget Sound area.

25 Refer to the Response to Comment 34-16 for a discussion of leak detection systems, and to the Response to Comment 123-9 about right-of-way maintenance. NTPC would be liable for damages for which NTPC was responsible.

26 Potential impacts on water quality and fisheries resources are addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

27 This comment was considered, but the evaluation in the ES has not been changed. Whether the potential impacts would be "major" or "minor" is a subjective and relative estimate. In the ES the attempt was made to determine the significance of specific potential impacts in terms of the overall resource base of each environmental component and the potential impacts of the entire project on the resources.

28 The statements in the ES are judgements based on available data. The potential impacts on one year class of salmon would not be expected to wipe out the entire year class in a particular stream or set of tributaries. The potentially damaging impacts would be localized along a stream and would not necessarily affect the entire fishery resource within the stream.

29 Habitat degradation attributed to an oil spill would adversely affect fish using that habitat. Impacts, as identifed in the text, include destruction of algae and plankton, destruction of food organisms, and impacts related to toxicity to fish.

30 This comment refers to the Land Use section. Impacts to watersheds and aquifers are described in the Aquatic Resources sections of the ES.

31 The information in this comment has been reviewed and no text changes in the FES have been made.

32 This comment refers to a section addressing commercial vessel traffic. Impacts to recreation and pleasure boating are discussed in the sections on Recreation in Chapters 3 and 9.

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33 The collapse of the Hood Canal Ridge and potential impacts of that on the NTPC proposal are discussed in the sections on Transportation and Utilities in Chapters 2 and 3 of the FES.

34 The information in this comment is included in Chapter 9 of the FES.

35 This information is discussed in the DES and in the FES, however, discussion of site specific details is beyond the scope of the ES.

36 Highway 101 along Hood Canal would not be blocked. The narrative does recognize that there may be some conflict between recreationists and construction related activities.

37 Refer to the Response to Comment 123-27 concerning determinations of level of significance of potential impacts.

38 See the discussion of methodology in the section on Pipeline System Economic Conditions in Chapter 3 for an explanation of how the pipeline work force was distributed. While the work effort would vary along the pipeline route, it was considered that an attempt to account for such variations would not significantly improve the estimates.

39 Transient population attributable to pump station work forces is included in the referenced table. However, the table does not reflect the transient population attributable to the company inspection and construction management work force.

40 NTPC has not indicated a commitment to providing funds for impacts to specific facilities. NTPC is committed to providing assistance and advice in applying for grants or loans and to performing detailed housing surveys which could be used by local planners. Refer to the Response to Comment 64-1 concerning potential impacts on roads and highways.

41 A study by Mountain-West Research (1979) reports that in former pipeline projects pipeline workers utilized mainly transient lodging facilities and eating/drinking establishments. Transient lodging was fully occupied for the short term, which meant some difficulty for owners in accommodating all customers. The study found that owners of small businesses welcomed the gains from increased spending. Since pipeline workers spend 10 hours a day, 6 days a week working, they frequent restaurants at off-peak hours, not posing a significant impact on work loads but bringing extra profits to those businesses. Businessmen did not report significant adverse impacts.

42 Refer to the Response to Comment 113C-6.

43 The intent of the Map Addendum is to identify specific impacts and impacted areas. Consequently watershed regions and geologic areas are not included. The Skokomish and Squaxin Island Indian Reservations have been added. Soil impacts of compaction and erosion are currently on the alignment sheets.

44 The sections on Biological Components of Marine Resources have been completely rewritten for the FES. Marine resources map coverage has been revised and expanded. These comments were considered during the rewriting and revision.

45 The text has been reviewed and it has been determined that the information presented is adequate.

46 The information in this comment has been evaluated and the impact assessment as presented in the DES has been determined to be appropriate.

**124**

1 This sentence has been revised to read: "a total of more than 18,000 acres of soils in the pipeline right-of-way would be unproductive during construction."

2 In terms of local (County) or regional production the economic impact would not be significant, therefore the analysis was not pursued further as suggested in this comment. See the introduction to Chapter 3 in the DES and FES.

3 Potential impacts on specific soil conservation systems have not been identified because of the general nature of NTPC's project proposal.

4 NTPC is committed to maintaining the right-of-way throughout the life of the project. Topsoil would be replaced when the trench is backfilled. It is not clear what future use is being referred to in the comment.

5 Chapter 3 has been revised to address this concern.

6 NTPC is committed to revegetating disturbed areas. Steep slopes, difficult to revegetate, will be stabilized with mulches and/or jute and vinyl netting. Back-sloping trenches will be installed at 50 ft. intervals on slopes exceeding 2:1.

7 Generally those items discussed in Chapter 1 would apply to the original entry with subsequent erosion control actions being dependent upon stipulations of right-of-way permits and easements. However, NTPC has indicated that it would maintain the right-of-way for the life of the project.

8 The erosion control measures proposed by NTPC have been described in the section on the NTPC proposal in Chapter 1 of the FES. Also, refer to the Response to Comment 120-75.

9 Only land with soils qualifying for prime farmland designation in North Dakota are mapped. Since some of this land is not in agricultural use, displaying it from the map source available to us did not appear worthwhile. Impacts to prime farmlands would be essentially the same as the impacts to other agricultural land uses described in

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**CONT**

the ES. Given the level of data available, the approach used was to estimate the amount of prime farmlands potentially affected by proposed and alternate routes for comparative purposes.

10 Refer to the Response to Comment 124-7 concerning right-of-way maintenance, and to the Response to Comment 113C-6 concerning mitigation measures.

10A The current route proposal of NTPC, which is discussed in Chapters 1 through 7 of the FES, includes the route segments south of Coeur d'Alene Lake and over Jackass Pass.

11 The materials from the SCS field offices were used extensively by several disciplines in determining probable impacts along the pipeline route. Items pertaining to wildlife, land use, and vegetation were integrated into the narrative or Map Addendum, often without identifying the source. The exigency of space did not allow either the inclusion or citing of all SCS field office data received and utilized.

12 Refer to the Responses to Comments 124-7 and 34-28.

13 Refer to the Response to Comment 107-2.

14 Symbols indicating river crossings have been revised in the Map Addendum.

15 The FES has been revised in the light of the new route and the availability of soils data for Sanders and Missoula counties. The need for more erosion control measures, as well as the difficulty in establishing vegetation in this region, have been stressed.

16 NTPC has committed itself to erosion control measures for the life of the project.

17 As stated in the DES and FES construction across wetlands would be avoided if possible. In portions of eastern North Dakota and Minnesota it would not be possible to avoid all potholes and wetlands.

18 The sentence referred to was somewhat ambiguous, and it has been deleted. It is clearly stated that restoration efforts would be subject to the requirements of landowners or state or federal agencies with jurisdiction.

19 As the port and onshore storage facilities are located in a Seismic Risk Zone 3, NTPC has indicated that, if the NTPC proposal is approved, it would conduct a detailed geotechnical study, including a thorough siesmic risk analysis, and would incorporate the results of the study into final project designs to insure project safety.

20 The Bellingham, Dick and Rifle series are major soils within the revised pipeline route and are included in the legend in the FES.

21 The statement was suggested by a geologist with the USGS Puget Sound ESA Project and confirmed by the Crude Oil Transportation System technical team geologist.

22 Detailed soils information is available for about 20 percent of NTPC's proposed pipeline route. Chapter 2 has been revised to indicate which sections are covered by SCS surveys and which are not.

23 The Alignment Sheets and the Table of Soil Characteristics in the Map Addendum show some mapping units with a single soil series, while recognizing that these probably do not occur in reality. Terminology has been changed to reflect this.

24 An environmental assessment of the route through the National Forests by the USFS does not indicate serious problems in soil revegetation in the northern Rocky Mountains. Additionally, there is more precipitation in the Rocky Mountains, while many of the soils of the Great Plains are clayey or shaley and, due to the low precipitation, are more difficult to vegetate.

25 The information in the text has been reviewed and errors have been corrected where identified.

26 Forage production estimates are difficult to evaluate accurately over lengthy distances and have therefore been omitted. Such estimates are not necessary to adequately evaluate potential impact.

27 The photo descriptions are accurately numbered. In caption 4 "eastern" and "western" were transposed in the DES and have been corrected in the FES.

28 These corrections have been made.

29 The section on Pipeline System Recreation in Chapter 2 has been revised.

30 The section on Pipeline System Recreation in Chapter 2 has been revised and the reference to the casino development deleted.

31 NTPC is committed to revegetating the backfilled right-of-way "rapidly and permanently", planting mainly in late spring or early fall. Planting methods would be consistant with the wishes of the landowner.

32 This correction has been made in the FES

33 Reliable productivity ratings for forest types crossed are not available at present. Moreover, estimates of board feet/acre would not necessarily measure the timber loss along a narrow right-of-way, since timber is normally harvested in patches of relatively large size.

34 Possible impacts from trespass are addressed in other sections of the ES, where appropriate. Refer to the sections on Recreation and Social Conditions in Chapter 3.

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35 This sentence has been deleted.

**125**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 125 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

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## General Response

The NTPC project proposal, as described in Chapter 1, has been designed by NTPC and submitted to BLM as part of NTPC's application for a right-of-way permit and for selection under Title V of the Public Utility Regulatory Policies Act of 1978 (refer to the Introduction to the FES for details). It is this preliminary proposal from NTPC which has been described and evaluated by BLM in the FES. A number of items in Comment Letter 126 are questions about design or about why particular design elements were or were not included in NTPC's proposal. In most cases, these are questions that could only be answered by NTPC, and often not until some later stages in project design development--stages which may or may not occur depending upon whether or not the NTPC proposal is approved or implemented. Questions of these types have not been responded to specifically.

Many specific details of the proposal design are not included in Chapter 1, either because they are not available from NTPC, or because they were not necessary for assessment of potential environmental impacts. For example, if failure of a specific project component might lead to an oil spill, it was considered appropriate to analyze the potential impacts of oil spills without describing the detailed design of the project component.

In several sections of Comment Letter 126, questions pertaining to the possible increased throughput to 1,283,000 bpd are raised. NTPC's proposal is for a maximum throughput of 933,000 bpd, and that is what is evaluated in the FES. If NTPC's proposal is approved and implemented, and if the NTPC is required to provide facilities to handle the additional throughput, a separate ES would be required to evaluate the potential impacts from the additional facilities which would have to be built by NTPC, and presumably by other companies as well.

All items were read and analyzed by the appropriate technical specialists. If it was determined that an issue was adequately covered in the DES and the FES or in this general response, then the item has been left unmarked. Items are numbered separately within each heading of the Table of Contents of Comment Letter 126. The appropriate contents title appears at the head of each column of specific, numbered responses.

## AIR QUALITY

1 Contributions from slash burning were not considered because emissions are intermittent and not site-specific. There is also no evidence that there would be interactions between project emissions and emissions from slash burning.

2 Modeling indicated no significant interactions between Northern Tier pollution sources and existing sources outside Port Angeles. The statement that the California Air Resources Board projected impacts on the entire Los Angeles Basin from the SOHIO project was unfounded.

Proposed sources anywhere in the Los Angeles Basin are subject to offset requirements because existing pollution levels already exceed the standards.

3 The basic uncertainties in diffusion models and uncertainties in the meteorological impact make it difficult to determine the exact value of pollution concentrations. Models generally overestimate rather than underestimate concentrations. They therefore identify potential violations. However, there are too many uncertainties to tell exactly how many times violations would occur.

4 Refer to the Response to Comment 62-1.

5 The statement on page 21 of the Summary of the DES in the fourth paragraph, second sentence, is in error. No violations of Class II standards would be expected. However the statement concerning Class I standards, in the last sentence, is true. The statement in the section on Port Air Quality in Chapter 3 refers to the Class II standards.

6 Refer to the Response to Comment 74-1.

7 Refer to the Responses to Comments 86-50 and 86-51.

8 Refer to the Response to Comment 74-2.

9 The added storage at Clearbrook would be about 2.5 million barrels.

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**CONT**

## AIR QUALITY

10 Wood burning was not considered for the reason that it is difficult to determine how much wood is burned in the fireplaces. Most people get their own wood from the forest, and it is impossible to know how much wood is fetched.

11 NTPC would use watering to control fugitive dust during construction. No noticeable adverse impacts would be anticipated.

12 The ES does discuss air quality impacts during construction. Impacts are not considered significant beyond the construction site. Increased traffic in Port Angeles would raise emission levels. However, they would be small compared to existing emissions.

13 Ambient air quality standards are designed to protect the vast majority of the more sensitive individuals from adverse health effects. Since the ambient standards would be met, no adverse health impacts are anticipated. A discussion of the health basis for the ambient air quality standards is beyond the scope of the ES.

14 Fugitive dust would be controlled by watering. No violation of air quality standards would occur.

15 Limitations of port usage as a result of adverse weather was included in the queuing model.

16 The emission scenario used for the photochemical modeling assumed two ships would be ballasting in port, with neither ship having segregated ballast. It was assumed both ships would have to ballast up to 20 percent of dead weight tonnage.

17 The primary reaction involving $SO_2$ is oxidation which forms sulfates, $SO_4^=$. This has been considered in the visibility analysis. $SO_2$ is not an important species in ozone formation.

18 Refer to Responses to Comments 74-7 and 93-3.

19 The concentrations given are for total nitrogen oxides, which consists of NO and $NO_2$. There is an ambient standards only for $NO_2$. Even if all NO converts to $NO_2$, this standard would still be met.

20 Emissions from oil spills or from purging were not considered because they would occur infrequently and with no regularity. Ballasting would occur on a regular basis, and was therefore considered to be a reasonable worst-case operation.

21 Visible emissions from tanker stacks would consist mostly of water vapor. They would not have detrimental effects on health, safety, or welfare of any person. Emissions of particulates would be very slight. Emissions of $SO_2$, $NO_x$, and HC would be invisible.

22 Refer to the Response to Comment 74-2.

23 HC emissions would not effect visibility. The most significant pollutants affecting visibility would be particulates, and sulfates. Sulfates form from the oxidation of $SO_2$.

24 Refer to the Response to Comment 74-5.

25 The ballasting emissions have been revised upward to 1.1 lb/1000 gallons based on recent studies.

26 Noise violations have been recognized. However, mitigating measures would require the cooperation of local officials in enforcing them. So far no commitment by local officials has been made regarding mitigating measures.

27 Tank design would consist of floating roofs with primary and secondary seals. Refer to the TMC section of Chapter 1 for details of the TMC proposal.

28 Emissions were not quantified. However, they would be lower than those for Northern Tier, as throughput is lower.

29 A qualifying statement was made here because no quantitative figures were available.

30 Refer to the Response to Comment L-46-4.

31 Refer to the Response to Comment L-46-14.

32 Refer to the Response to Comment L-46-18.

33 Refer to the Response to Comment 126-Air Quality,13.

34 Diesel back-up would be infrequent. It was therefore not considered in the ES.

35 It is not known whether brush would be burned. If it is performed, it would be subject to local controls.

36 There is no information on the type of material that would be used.

37 Refer to the Comment 126-Air Quality, 34.

38 The area is not a non-attainment area for $SO_2$. The Washington State Department of Ecology is studying the situation at present to determine the status.

39 No vapor recovery system is proposed. Vapor recovery is not considered unless it is demonstrated that adverse air quality impacts could result.

40 Refer to the Response to Comment 126-Air Quality, 38.

41 These are based on data for Bellingham and Whidbey Island.

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## AIR QUALITY

42 The statement on page 8-29 of the DES regarding downwind distance was incorrect. Highest concentration would occur about a mile to the east of the site.

43 The data for the 1,283,000 bpd throughput is given in Chapter 6.

44 Refer to the Response to Comment 126-Air Quality, 20.

45 Refer to the Response to Comment 126-Air Quality, 38.

46 Ozone measurements are being taken in Olympic National Park. These data are not available yet.

47 Refer to the Response to Comment 93-3.

48 These data were checked against data from the Olympic Air Pollution Authority and from some industries themselves. The data were found to agree quite well.

49 Refer to the Response to Comment 62-1.

50 Refer to the Response to Comment L-46-12.

51 Refer to the Response to Comment L-18A-6.

52 The detailed technical data, with references, are included in Science Applications, Inc. (1978).

53 Refer to the Response to Comment 74-2.

54 NTPC's proposal includes a two-berth facility. Refer to Response to Comment 62-1.

## ALTERNATIVES

1 The statement referred to has been revised in the FES to include the other alternative proposals.

2 Some expansion of the mid-continent system is in process and a small part has been completed. The LOOP system expansion is scheduled in stages with the first stage scheduled to be completed in 1980. The additional stages are scheduled to be completed in 1982 and 1989 (Department of Energy, 1979). With this type of schedule it is unlikely that the construction of one section will proceed faster than another at such a rate to cause problems of too much oil in storage, or a large surplus of oil pipeline capacity.

3 A product line from the western Washington refineries to markets in eastern Washington could reduce a product shortfall in that area. The questions raised by this proposal, which are beyond the scope of this ES, are such things as: could the line be constructed, could the refineries increase their output to supply the required products, could the refineries commit their output to the new markets, could the refineries increase their output and, if so, could additional crude oil be delivered to them.

4 Refer to the Response to Comment L-46-32.

5 Throughout the FES the analyses are based on studies of 2-mile wide corridors. Precise pipeline alignments within the corridors have not been determined by any of the applicants. Generally the alignments would not by determined unless a particular project was approved and then advanced to more detailed design stages, which would include field surveys and purchase of easements along the proposed alignment. One purpose of the ES process is to identify potential impacts within a corridor at a time when decision making is still flexible enough to permit avoidance if possible.

6 The 150,000 bpd figure is consistent with the report by the Department of Energy (1979). The text of Chapter 9 of the FES has been revised.

7 BLM is not aware of whether or not NTPC has filed the statement.

8 The Title V application from Kitimat Pipe Line, Ltd. (KPL) is discussed in Chapters 1 and 8 of the FES. As of June 1, 1979, KPL had not reactivated its application to the Canadian NEB.

9 The selection of route segment alternatives was based, in part, on information received at NTPC public information meetings and in comments presented to BLM and other federal and state agencies. The selection was not based on the numbers of people who presented suggestions.

10 At Port Williams and Port Partridge, where the proposed pipeline would cross the shoreline, duration of noise impacts during construction would be longer than at other points along the pipeline. This is due to the fact that dredging, pipe pulling, and other activities would be required. It is estimated that noise impacts at the shoreline crossings would last for a period of about 4 to 6 weeks. Noise levels of up to 70 dBA could occur at points nearest the construction site. However, noise levels would not be constant, but would vary according to the particular type of operation being carried out at a given moment.

There is no information on where the stockpiling areas would be located. No projections for noise levels in stockpiling areas were made.

11 The Title V application from Trans Mountain Oil Pipe Line Corporation (TMC) is discussed in Chapters 1 and 8 of the FES.

12 As of August 1978 the 1979 World Almanac shows no U.S. Tankers in the 220,000 DWT class in operation. No additional information is available in regard to ships being built and where they will be registered. Considering that the present facilities in the Gulf Coast do not accommodate vessels of that class, the likelihood of large ship construction for delivery of Alaskan North Slope crude to the Gulf States via the around the Horn route would be considered small. For a surplus of 500,000 bpd of ANS crude to be delivered around the Horn it would require ten 220,000

DWT tanker trips per month. For every additional 50,000 bpd of surplus another tanker trip would be required.

13 The Explorer pipeline has been increased to 145,000 bpd throughput. An expansion of the total product line from 380,000 bpd to 444,000 bpd is under construction and was to be completed by June 1979 (Department of Energy, 1979). This expansion would increase the crude oil capacity to 335,000 bpd to Tulsa and 235,000 bpd to Chicago.

AMOCO's expansion of the Texoma line by building a new line from Cushing to Chicago is still in the proposal stage. The cost, permits required, and contract information is not available.

The looping of the Capline segment is being carried out concurrently with the first stage of LOOP (refer to the Response to Comment 126-Alternatives, 2), with completion scheduled for 1980. It would provide an additional throughput of 1,400,000 bpd.

14 Refer to the Responses to Comments 126-Alternatives, 2 and 13.

15 The draft report by the Department of Energy (1979) stated that the Chicago line expansion was to be completed in September, 1978. Telephone consultation with the Department of Energy in June, 1979, indicated that the expansion has been completed with an increase in throughput from 382,000 bpd to 490,000 bpd.

16 The Williams Brothers pipeline expansion has been completed and now carries 120,000 bpd of crude oil to St. Paul. The Williams Brothers proposed expansion to the Wrenshall area is apparently still in the proposal stage.

17 The figure of 300 acres was an error and has been corrected in the FES. The proposed onshore storage facilities would require 140 acres at both Cherry Point and Burrows Bay.

18 The prediction of a 1 million bpd west coast surplus by 1985 is based on expansion of the Alaskan North Slope crude throughput to 2 million bpd plus the expansion of the Elk Hills reserve. The Department of Energy (1979) stated that a surplus of 600,000 bpd exists at the 1.2 million bpd throughput of ANS crude. If no changes are made to West Coast refineries to permit processing greater quantities of ANS crude, the increase from 1.2 million bpd to 2 million bpd would increase the surplus to 1.4 million bpd without expanding the Elk Hills reserve. Additional fields in Alaska are being explored, but at present none are in production. The percent of Alaskan crude that could be used on the west coast if the refineries retrofit to utilize the high sulfur crude would depend upon factors beyond the scope of this ES.

19 Alternative energy sources are addressed in the section on Other Alternatives in Chapter 9 of the FES. Increased domestic production and reallocation of existing supplies are components of the nations's energy situation which are part of the proposals covered in this ES, not alternatives to them. One of the purposes of these proposals is to facilitate increased domestic production in Alaska by enabling the greater production to be transported to existing refineries. The proposals could also facilitate reallocation of other existing crude oil supplies by providing a system of transporting crude oil from the west coast to the midwest and east. Therefore, these aspects of the energy situation are not treated in any detail as alternatives to the proposals.

20 The line fill of 13,740,000 barrels is for the entire system, from port to delivery facility. The line fill of 12,990,000 barrels is for the pipeline system only, from the onshore storage facility to the delivery facility.

21 BLM has not received any revisions for the data from NTPC which is presented in the table on "Estimated Source and Crude Oil Mix" in the section in Chapter 1 describing the NTPC proposal.

22 The Canadian government has indicated that sweet crude exports of 55,000 bpd would continue through 1982. It has not committed itself to any level of heavy crude exports beyond 1979.

23 The reference to the PACE study has been deleted from the FES.

24 Details and impacts of the potential expansion would be covered in a separate environmental statement. It is not known who would construct the new segment of pipeline, or what the costs would be. Also note that with the change in NTPC's proposal the circumstances related to the possible hook-up to the Puget Sound refineries have changed substantially. If NTPC's current proposal were approved, no storage would be required at North Bend, and there would be no need for a pipeline segment from there to the refineries.

25 NTPC revised the proposed route to include the Jackass Ridge segment. Environmental impacts for this portion of the route are discussed in Chapter 3 of the FES. One of NTPC's reasons for changing the route proposal in this area was to avoid environmental impacts along the route segment which was originally proposed. A modified version of that, Coeur d'Alene River, route segment is discussed in Chapter 9 of the FES.

26 NTPC proposes to transport 53% Alaskan oil and 47% foreign oil. It is not known whether or not that would represent greater U.S. dependence on foreign crude oil than would exist without the NTPC project. Exchanges with Japan, which are discussed in the section on Other Alternatives in Chapter 9 of the FES, could help to relieve the west coast surplus, but would cause greater dependence on foreign crude oil supplies.

27 A combination of alternative actions would probably result from decisions by mutually independent (and sometimes, competing) companies. There is no statutory means of enforcing a combination of alternatives nor of predicting which companies might make which decisions in the future. Therefore, the ES does not contain an analysis of any specific combinations. A general discussion of combinations of alternatives is included in the section on Other Alternatives in Chapter 9 of the FES.

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ALTERNATIVES

28 The statement referred to in this comment was in error and has been deleted from the FES.

29 These estimated spill volumes are based on statistical analyses of spill sizes from in-transit, at-berth, tank farm, and pipeline operations. The differences in estimated volumes result from the longer distances to Burrows Bay and Cherry Point than to Port Angeles. However, the different volume estimates are all within the 95% confidence limits. Details of the analyses can be found in the report by the Oceanographic Institute of Washington (1978).

30 Unit Trains have been addressed in the section on Other Crude Oil Transportation Systems in Chapter 9 of the FES.

31 It was determined that it was more appropriate to present the different spill risks for the different alternatives. Spill risks for submarine pipelines are different from spill risks for onshore underground pipelines. Refer to the section on Pipeline System Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 of the FES for more detailed discussions.

32 Refer to the Response to Comment 126-Alternatives, 29.

33 The areas which could be affected by oil spills were discussed and illustrated in the DES for both Low Point and Freshwater Bay. Note that the FES contains revised trajectory analyses.

34 The inference suggested in this comment was not intended. Also note that the Cross Puget Sound route is now NTPC's proposed route and is discussed in Chapters 1 through 7 of the FES. The Around Puget Sound route is discussed as an alternative in Chapter 9 of the FES.

35 The FES has been revised to include discussions of land use plans, zoning and shoreline master plans in appropriate sections of Chapter 9.

36 The potential environmental impacts at the alternative port and onshore facility sites do vary, depending upon the existing environmental conditions. Specific comparisons of those alternatives are not included in the ES because they would be entirely subjective. The potential oil spill risk estimates can be compared.

37 The FES analyzes the applicants' proposals, as presented to BLM, and certain proposed alternative port and onshore storage facility sites and route segments. Whether or not there were other onshore storage facility sites available in Clallam County when NTPC initiated its project is not pertinent to the environmental analysis.

38 The opposition to the Stampede Pass route came from the cities of Tacoma and Seattle and was based on the fact that the route would cross the Green River watershed which provides their municipal water supplies. Note that the Stampede Pass route segment alternative has been deleted from the FES, since it would not be an alternative to any currently proposed route.

39 The opposition to the Coeur d'Alene route segment was based on the fact that the route would cross the Spokane-Rathdrum Prairie aquifer which was designated a sole-source aquifer by the U.S. Environmental Protection Agency.

40 The section on Alternatives, Chapter 9 of the FES, has been revised to include other alternatives that could meet the demand in the northern tier states.

41 The Trans Mountain proposal is discussed in Chapters 1 and 8 of the FES. Exchanges with Canada are discussed in the section on Other Alternatives in Chapter 9 of the FES.

42 In this instance the federal government has the authority to evaluate proposals and to decide whether or not to issue permits that are required by federal law. In the permitting process consideration must be given to minimizing any risks. Land use decisions on private property would be the concern of the land owners and state and local governments.

43 For the purpose of this environmental statement the actions of government officials are presumed to be legal unless successfully challanged. It is not appropriate to discuss the motives of officials. The Evans amendment is discussed only in the terms that it affects the proposals presented in this FES.

44 The comment apparently refers to contingency measures in operation of the project since the construction cost estimates include explicit allowances for contingencies in construction. The planning of the project includes the consideration of operational contingencies and the costs of such measures are included in the construction and operation cost estimates. Such items include oil retention basins, spill containment features, fire equipment, block valves, and monitoring devices. Additional contingency plans and measures yet to be developed pertain primarily to operating procedures and coordination measures, which are not anticipated to add significantly to costs.

45 The effect of the proposals on balance of payments problems has not been determined. Effects on international relations will be examined as one of the criteria for evaluation called for by the Public Utilities Regulatory Policies Act.

46 The financial capability of applicants is one of the criteria to be considered in evaluating proposals under the Public Utilities Regulatory Policies Act. Purchasing methods and other aspects of construction which could result in inflated costs are considered to be adequately safeguarded against by public utility regulatory practice. In tariff determination, a return would be allowed only on reasonable costs and all costs would be subject to review in the process.

47 The most recent tariff estimates available (U.S. Department of Energy, 1979) are presented in a table in Chapter 1 of the FES. Qualifications to those estimates are discussed in the accompanying text.

48 Costs for the 1,283,000 bpd throughput are not included in Chapter 1 because that throughput is not included in any of the proposals being evaluated in this FES. NTPC's estimate of additional costs to NTPC if it is required to provide facilities for the 1,283,000 bpd throughput is included in Chapter 6 of the FES.

49 While power costs in the Pacific Northwest are expected to rise, it is not clear that they will rise more rapidly than other prices. Insofar as price increases keep pace with each other, comparisons are unaffected. However, the Department of Energy has been asked to consider the effects of higher costs for additional power in their analyses. Contingency allowances in project cost estimates are based on the degree of uncertainty about the construction techniques and environmental conditions involved. Techniques and conditions are relatively well-known for the Northern Tier proposal with the exception of the submarine pipelines. These, however, comprise a small part of the overall project. The Alyeska pipeline cost several times more than the original cost estimates. It was built in an environment for which no similar construction experience existed, and required completely new design concepts and construction methods. A cost analysis by the Department of Energy (1979) concluded that the Northern Tier cost estimates appeared to be conservative. The pipeline would not necessarily be dismantled on abandonment. Abandonment procedures are discussed in Chapter 1. Losses and clean up costs attributable to an oil spill would be collectible from the parties responsible for the spill. Insurance and performance bonds are not specifically addressed in the ES; they would be considered in the preparation of the stipulations to a permit. The costs of stream and highway crossings were separately calculated and are included in the cost estimates, but the display of this information is not considered necessary to the ES. The cost estimates are presumed to include allowances for normal delays due to strikes and lawsuits since the estimates are based on construction experience. Should the project be
49 delayed for any substantial length of time, current inflationary conditions would increase costs, but it is not considered appropriate to attempt to forecast such a delay. Having the right material and manpower when needed is an important element of project planning, but is not considered a concern of an ES.

50 Local and county sales taxes are included in the cost estimates.

51 The Department of Energy cost analysis was based on an early project cost estimate at January 1977 price levels. The basic data are shown in their report (DOE, 1979). Their analysis was made in the summer of 1978. No allowance was made for any escalation of costs subsequent to 1977. Annual construction cost indices for interstate oil pipeline companies are compiled by the Federal Energy Regulatory Commission (undated). The latest available cost indices for the total construction costs of trunk pipelines, and the component costs of line pipe and construction work are shown below for the years 1972 to 1977 (1947 = 100):

| Year | Total | Line Pipe | Construction |
|---|---|---|---|
| 1972 | 221 | 219 | 204 |
| 1973 | 235 | 235 | 219 |
| 1974 | 279 | 299 | 242 |
| 1975 | 343 | 409 | 269 |
| 1976 | 361 | 423 | 284 |
| 1977 | 368 | 413 | 298 |

The tariff estimates are discussed in the revised Chapter 1 of the ES.

52 Mitigation measures are only those measures which might be undertaken to reduce impacts of the NTPC project as designed. The cost estimates include the costs of features proposed by NTPC to reduce impacts from what they might otherwise have been. Measures included in the project design, however, are not considered to be mitigation. The costs of mitigation have not been estimated.

53 NTPC's Cross Sound route proposal is discussed in Chapters 1 through 7 of the FES. The discussion is as extensive as the available data allowed. Refer to the Response to Comment 79-1 concerning the decision not to prepare a revised DES.

54 No concrete agreements have been made between NTPC and the connecting pipeline companies. The 50 refinery figure and the 3.6 million bpd figure indicate the potential capacity available in the northern tier area. The consideration of any additional areas or refineries which ultimately could be reached by additional construction of lines or reversal of systems is beyond the scope of this ES.

55 Retrofitting of refineries, crude oil exchanges, reallocation and increased production of domestic supplies have been discussed in the section on Other Alternatives in Chapter 9 of the FES.

56 The statement is based on data presented in Chapter 3 of the report by the U.S. Department of Energy (1979), and refers to declines in physical availability assuming existing distribution patterns. The DOE report shows the information requested.

57 The existence of oil transportation contracts is not considered pertinent to the environmental statement. It is pertinent to the consideration of financial feasibility which is the subject of a separate analysis.

58 Regarding the existence of contracts, see the response above. Preliminary estimates of the demand for crude oil by type and market areas are presented in the DOE draft report (1979).

59 Information presented in the FES is considered adequate to meet the requirements of the National Environmental Policy Act. Preliminary findings of the DOE study were presented in the DES where they were accompanied by the supporting information and analyses.

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## ARCHAEOLOGICAL/HISTORICAL

1 The general procedures for cultural resources management activities, including provisions for adequate time to carry out the required activities, are covered in the proposed Memorandum of Agreement. Exact details would be contained in actual contracts for the work and therefore cannot be spelled out at this time.

2 The circumstances which could result in unavoidable adverse effects to cultural resources are explained in Chapter 5. Only under emergency conditions would mitigation activities be constrained by the construction schedule.

3 If the NTPC proposal is authorized and implemented, NTPC would probably hire contractors to carry out the cultural resources surveys and any required mitigation activities. The cultural resource personnel would be required to meet the professional qualifications prescribed by federal regulations. This is stated in the proposal for a Memorandum of Agreement, referred to in Chapter 10 of the FES. The work would be subject to review by the BLM and the Washington State Historic Preservation Officer. In carrying out cultural resources surveys it is normal procedure to consult with individuals and specialists in the local areas of potential impact.

4 It was determined that discussions of resources and potential impacts at the suggested level of detail could not be included in either the DES or the FES. Detailed surveys and discussions of resources would be accomplished under the provisions of the proposed Memorandum of Agreement which is discussed in Chapter 10.

## EASTERN CLALLAM COUNTY

1 Refer to the last paragraph of the Response to Comment 51-6 and to the Response to Comment 63-3.

2 Refer to the Responses to Comments 71-1 and 71-2.

3 Refer to the sections on Recreation in Chapters 2 and 3.

4 Refer to the section on Aquatic Resources in Chapter 3.

5 Refer to the sections on Marine Resources in Chapters 2 and 3.

6 Refer to the section on Marine Resources in Chapter 3.

7 Refer to the section on the NTPC proposal in Chapter 1 for the location of staging areas. Potential impacts from staging areas are discussed in various sections of Chapter 3.

8 The locations of proposed facilities associated with the current NTPC proposal are identified in the NTPC section of Chapter 1. Potential impacts are discussed in Chapter 3. Refer to the Response to Comment 71-1 concerning a supplemental ES.

## EMERGENCY SERVICES

1 The provision of security for its property and equipment would be NTPC's responsibility. Security and evacuation plans would be covered in the Contingency Plan which would be required by the U.S. Department of Transportation if the NTPC proposal is approved. NTPC's draft Contingency Plan is described in Chapter 1. The sections on Social Conditions in the FES contain a discussion of disaster plans.

2 Fire protection ratings, by class of fire defense capability, have been reported in the FES. These ratings consider the adequacy of access roads, available manpower and firefighting capability.

3 The table cited in the comment has been deleted from the FES. The section on Port-Social Conditions in the FES has been revised to include the correct information.

4 The comment refers to a section of the DES which did not pertain to Clallam County.

5 The section on Port-Social Conditions in Chapter 3 of the FES has been revised.

6 The FES contains a substantially revised section on Port-Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 in which variations in blast effects are discussed. Historically, fires at tanker berths have rarely spread to other facilities. A fire at NTPC's proposed port facility would not be expected to spread because of the distances to other combustible materials.

7 Since the strain on facilities, although severe, would be short-term and would not alter the pattern of future development, no significant adverse impacts have been identified.

8 The table on Estimated Frequency of Explosion and Fire Casualties in Chapter 6 has been revised according to data received since the DES was prepared. If the NTPC proposal is approved and if NTPC is required to provide facilities to handle a throughput of 1,283,000 bpd a separate ES would probably be required to assess the potential impacts of the additional facilities handling the expanded throughput. NTPC has not proposed and BLM is not aware of any available plan or method of warning against explosions or fires. Blast effects are discussed in the new sections on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 of the FES. The chlorine tanks at ITT-Rayonier are under pressure and would not be expected to be affected by external pressure.

9 Answers to the specific questions in this comment are not available. The revisions of the sections on fire and explosion risk analyses include expanded discussions of persons and property which could be at risk.

10 Refer to the Response to Comment 126-Emergency Services, 1.

11 BLM has not been able to obtain any information with which to answer this question.

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## EMERGENCY SERVICES

12 The increased risk of explosions, if any, of tankers without inerting systems is unknown. In the risk analyses conducted for this ES, no distinctions pertaining to types of tankers were made.

13 The FES contains a new section on Port-Oil Spill, Fire and Explosion Risk Analyses in Chapter 3, and the assessments of potential impacts from fire and explosion have been revised throughout Chapter 3 of the FES.

## ENERGY

1 NTPC's proposal indicates the intent to obtain power from Port Angeles City Light Department for the post facility.

The potential impacts of that proposal are addressed. Other potential power sources have not been identified. The Washington State Emergency Powers Act gives priority to energy and energy related facilities over other power users. The specifics of such special treatment would depend upon the extent and length of a power shortage. Potential power rates for NTPC are discussed in the section on Port-Economic Conditions in Chapter 3. The possible use of diesel fueled combustion turbines has not been addressed in the ES. Exhaust could be treated to some extent. In general, such emissions would be much less significant than emissions from tankers' engines.

2 The comment refers to the chapter which describes the existing environment. The potential impacts are discussed in Chapter 3.

3 This inconsistency has been corrected in the FES.

4 Reheating of oil is not expected to be required. Therefore, NTPC has made no proposal for reheating and BLM has not identified any potential impacts related to this issue.

5 Since a new line could be built to replace the existing line, any significant impact to the use or the stability of the Hook would be unlikely.

6 The appropriate years have been added to the table.

7 The projected dates for commercial operation of WPPSS Units 4 and 5 have been updated.

8 Within the ES format, the potential impacts of the proposed project on electrical supplies is discussed in the section on Port-Transportation and Utilities in Chapter 3.

9 The potential impacts of curtailment of power to other users is discussed in the Port-Transportation and Utilities section of Chapter 3.

10 Potential impacts on power rates are discussed in the section on Port-Economic Conditions in Chapter 3.

11 This concern is discussed in the Topography/Geology and Land Use section of the FES.

12 The lack of additional cheap power is not discussed because it is not considered a primary problem to industrial development. Local power conditions and related project impacts are discussed in several places in the FES.

13 Tanker engines would not be expected to cause any significant temperature effects on water quality or other marine resources. Any impacts would be localized, of short duration and dissipated without significantly altering the water temperatures.

14 From the current electrical supply and demand forecasts it appears that without the proposed NTPC load, Clallam County PUD could meet its firm energy commitments even in the event of a critical water year.

15 These issues are discussed in the section on Port-Transportation and Utilities in Chapter 3. Refer also to the Response to Comment 126-Energy, 1.

16 NTPC's potential impacts on regional power supplies are discussed in the sections on Transportation and Utilities in Chapter 3. NTPC's potential power requirements would not be expected to significantly affect the regions' ability to attract new industry to Washington and the surrounding states.

17 Results of an analysis of the net energy balance for the proposed Northern Tier pipeline is presented in Chapter 1. Information for other proposals and alternatives is presented as available where they are discussed. Information available is inadequate to permit consideration of the energy loss involved in possible reductions of the marine biomass. It has been estimated that the energy consumed in transporting bunker fuel would amount to about 4,038,000 million BTU's or about 0.3% of the total energy consumed over the project life.

## ENGINEERING

1 The test to 90% of yield strength is carried out at the pipe mill (see Chapter 1). Hydrostatic testing in the field would be to 125% of the internal design pressure of the pipeline.

2 Engineering analysis has indicated that there are not expected to be any problems with floating roofs for tanks the size proposed by NTPC.

3 Dripping from the quick disconnects would go into holding tanks, and nozzles and lines would be drained into tanks after disconnection. Additional details on spill prevention would be addressed in the final Oil Spill Contingency Plan which would be developed if the NTPC proposal is approved and implemented.

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ENGINEERING

4 The specific details for pile driving weren't necessary in the process of identifying potential impacts for analysis in the FES. Final design detail will not be developed unless the NTPC proposal is authorized.

5 Tank mixers are proposed for the purposes of preventing sediment buildup on the bottom of the tanks and for maintaining uniform temperature of oil within the tanks.

6 It was determined that additional detail on batching was not necessary for impact analysis.

7 NTPC has indicated that holding basin design would meet or exceed the requirements of the National Fire Codes.

8 The discussion was not expanded in the FES because it was determined that additional detail of this kind was not necessary for analyses of environmental impacts.

9 Refer to the preceeding response and to the Response to Comment 51-12.

10 Refer to the Response to Comment 126-Engineering, 8.

11 Refer to the Response to Comment 126-Engineering, 7.

12 The figure was incorrectly titled in the DES. The title has been changed in the FES.

13 It is not possible to know detailed abandonment decisions or procedures at this time; however, they would be subject to all applicable federal, state and local regulations in force at the time of occurrence.

14 All discussion of potential impacts to the bluff at Green Point have been revised because of the change in NTPC's proposal for running the pipeline from the shoreline to the onshore storage facility site.

15 The summary section referred to has been deleted from the FES. Impacts from abandonment of the pipeline are discussed in greater detail in the subsections on the Abandonment Phase of Chapter 3. Financial arrangements such as a bond to cover costs of abandonment would be a consideration during the permitting process. For purposes of the impact analysis such arrangements are not assumed.

16 The data on abandonment procedures is presented in Chapter 1.

17 Significant amounts of sediment would not be expected to reach Siebert Creek during abandonment.

18 Refer to the Response to Comment 27-9.

19 Refer to the Response to Comment 27-10.

20 Refer to the Response to Comment 27-11.

21 Refer to the Response to Comment 27-12.

22 Refer to the Response to Comment 27-15.

23 Refer to the Response to Comment 27-16.

24 Refer to the Response to Comment 27-17.

25 Refer to the Response to Comment 27-18.

26 Refer to the Response to Comment 27-16.

27 Refer to the Response to Comment 27-18.

28 The magnitude of induced voltages would be determined during final design development of the cathodic protection system. The magnitude of the system voltages or current would not be large enough to cause significant environmental effects.

29 Refer to the Response to Comment 62-1. The proposed pipeline right-of-way width is described in the section on NTPC in Chapter 1 of the FES. Detailed alignments of the pipeline within the 2-mile wide study corridor are not known at this stage of proposal development.

30 Refer to the Response to Comment 86-29. Potential significant impacts which might result from stresses on the pipeline caused by natural forces are discussed in Chapter 3.

31 No significant potential impacts from corrosion of the pipe have been identified. Refer to the Response to Comment 15D-2.

32 Refer to the Response to Comment 51-12.

33 Specifications applicable to stream crossings would be followed as required by Department of Transportation (DOT) regulations. Double walled piping and alarm systems are not required at stream crossings by DOT regulations. Streams where the pipe could not be buried below the scour depth have not been identified. DOT regulations require that the pipeline be buried a minimum of 48 inches at waterway crossings unless rock excavation is encountered, where the cover may be reduced to 18 inches. Data concerning scour depths were obtained from reports submitted by the applicant and are on file with the Bureau of Land Management. Pipe wall thickness will be increased at major crossings, but this procedure has not been indicated for other crossings.

34 The sections on Biological Components of Marine Resources and the pertinent portions of the sections on Economic Conditions in Chapter 3 have been rewritten. Available information did not permit determination of the economic values of harvest or values of potential losses in the specific areas mentioned in this comment.

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## ENGINEERING

35 Hydrostatic testing standards are described in Chapter 1. The standards are designed to tolerate no oil leakage. The oil spill risk analysis discussed in Chapter 3 is based on historic data which included consideration of these factors.

36 Corrosion protection is described in Chapter 3. The cathodic protection system would be designed in terms of measurements made in the actual pipeline trench to ensure proper operation. Also refer to the Response to Comment 15D-2.

37 Proposed construction methods for marshy ground are described in Chapter 1.

38 Welds would be inspected on the barge prior to laying. Weld inspection would be carried out by an independent contractor, and regulated by the Department of Transportation, Office of Pipeline Safety. Submarine pipeline repairs can be made after laying.

39 Refer to the Response to Comment 126-Engineering, 8.

40 The potential impacts from seismic events on the proposed system are discussed in Chapter 3, in the sections on Geologic Hazards.

41 Revisions have been made in the FES to make it consistent with NTPC's current proposal.

42 The additional construction required for Phase II is described in Chapter 1. Installation of the third berth is not part of NTPC's current proposal and is therefore not included in Phase II construction.

43 Refer to the Response to Comment 62-1.

44 Data describing stream characteristics were obtained from reports submitted by the applicant and are on file with the Bureau of Land Management.

45 The criteria and blasting procedures would be determined during advanced design development and at the time of construction and would be subject to regulation by appropriate federal and state agencies.

46 Potential significant impacts from mechanical failures are discussed in Chapter 3, in the section on fire, explosion and oil spill risk analyses specifically, and in other sections where appropriate.

47 The specific answer to this question was not available when the FES was prepared. However, the fire and explosion and oil spill risk analyses discussed in Chapter 3 were based on studies which included consideration of human factors.

48 NTPC has indicated that tank spacing would meet or exceed the requirements of the National Fire Codes.

## FIRE PROTECTION

1 The discussion of fire protection services is more comprehensive in the FES than it was in the DES. It is pointed out in the FES that fire protection services in Port Angeles and Clallam County are generally inadequate for dealing with any amount of population increase as well as for dealing with the special problems that would be presented by the proposed port facility. It would be the responsibility of NTPC to provide the more detailed information needed by local fire protection officials. Refer to the responses to the comments in the Emergency Services section of Comment Letter 126.

2 This error has been corrected in the FES.

3 Refer to the Response to Comment 126-Emergency Services, 2.

4 Refer to the Response to Comment 126-Emergency Services, 8.

5 Currently available information from NTPC is presented in Chapter 1. Additional details would be worked out between NTPC and local fire protection officials if the NTPC proposal is approved. NTPC has indicated that it would have an independent study carried out to identify potential impacts on insurance rates, and would consider taking whatever measures were necessary to maintain existing rates in affected fire districts.

6 The table referred to in this comment has been deleted from the FES. The discussions of fire protection in the sections on Port-Social Conditions in Chapters 2 and 3 have been revised for the FES.

7 Refer to the General Response to Comment 126 concerning the third berth and the questions pertaining to NTPC's proposal. Chapter 1 contains a description of NTPC's general proposals concerning fire protection, and the statement that NTPC would consult with local fire protection officials to determine the details of facilities that would be provided by NTPC. Disaster emergency plans and the Ediz Hook water line are discussed in the sections on Port-Social Conditions. The potential economic impacts on taxpayers are discussed in the section on Port-Economic Conditions in Chapter 3. Refer also to the Response to Comment 126-Fire Protection, 5 (just above).

8 The availability of private boats cannot be predicted. Historically, the Coast Guard and private boat owners have provided whatever help they could in the event of an emergency.

9 These comments were received separately in Comment Letter 27. Refer to the specific responses to the same comments from Letter 27.

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## FISHERIES

1-4 The sections on Biological Components of Marine Resources in Chapters 2 and 3 of the FES have been completely rewritten. The issues identified in these comments were considered when the revisions were made.

5 Temperature changes in water bodies resulting from oil spills would be minimal or insignificant.

6 Potential costs cannot be reliably quantified because of the many unknown factors which would affect the outcome of a spill incident. The statement that fish would avoid a spill area is based on knowledge of expected behavior. All fish may not be able to avoid a spill and all affected food resources. As is stated, it would not be expected to be a serious problem.

7 No probability estimate is intended. The statement means that if plankton encounter oil in the marine environment, impacts upon those plankton are expected.

8 Only a portion of a particular fish population is likely to be reduced and since only the affected portion might require several spawning cycles to fully recover to preimpact levels, the overall population level should not reflect a significant economic loss to a fishery.

9 No oil-polluted runoff would be expected to reach Seibert Creek during heavy rain storms. NTPC has designed the holding basins with adequate capacity for the contents of one storage tank plus the estimated runoff from the maximum amount of rainfall recorded in a 24-hour period.

10 The statement made was ". . . might be contained within Port Angeles Harbor or in the vicinity of Green Point by strategic booming of the oil slick." Booming, during extreme meteorological and/or oceanographic conditions, is not affective in containing an oil slick. However, there may be times when conditions are such that booming might be worth attempting in order to contain the oil within the boom and shoreward.

11 Diverting river flow around the construction area would decrease turbidity and suspended sediment. It would not be expected to cause additional flood hazards or additional stress to aquatic biota.

12-13 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

14 Sediment impacts on fishery resources are addressed under biological components, in the section on Pipeline System Aquatic Resources in Chapter 3.

15-17 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

18 Stress related impacts caused by increased sediment including clogging and irritating fish gills and reducing the ability of sight feeders to capture prey are addressed under Biological Components in the section on Pipeline System Aquatic Resources in Chapter 3.

19 The appropriate section of the text has been revised in consideration of this comment.

20 Potential for discovery of oil in the Puget Sound area as well as the north coast of Washington appears to be quite low. The establishment of an oil port at Port Angeles would not appear to have very much impact (i.e., encouragement) on oil and gas exploration. There is no indication that drilling programs would increase as a result of an oil port.

21 This information has been recorded. Note that the cited table has been deleted from the FES.

22 Refer to the Response to Comment 145-11 concerning the list of mitigation measures. Refer to the Response to Comment 116-6 concerning the bonding issue.

23 The area being referred to in the comment is not clear. Information from the U.S. Corps of Engineers was used for the description of wind and waves at Ediz Hook. The discussion occurs later in the section referred to by the comment.

24 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

25 The error has been corrected in the FES.

26 The information provided in this comment was incorporated into the revision of the discussion of the Around Puget Sound route segment alternative in Chapter 9.

27 The section on the Future Environment has been deleted from the FES.

28 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

29 Avoidance behavior would be dependent on oil/water concentrations. Should an oil spill occur, concentrations would vary depending on streamflow and spill volumes. Oil concentration should decrease immediately after shutdown in most cases and delays to migrating spawners should not seriously affect productivity. Juveniles avoiding oil through early out-migration could suffer high mortality in marine waters. Juveniles avoiding oil in streams by concentrating in areas free of oil could suffer high predation rates. Since it is not known to what extent oil residues would be incorporated into sediments, should a spill occur, it is not known to what extent potential redds would be rejected. Oil spill impacts are further discussed in Chapter 3.

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**CONT**

## FISHERIES

30 The concern identified in this comment has been considered in the revision of the section on potential impacts to Aquatic Resources in Chapter 3.

31 The concerns identified in this comment have been considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

32 The NTPC proposal is not expected to require the construction of any new power generating facilities.

33 The potential impact on the boat launch facility has been identified. NTPC has indicated that it would finance relocation to a mutually agreeable location. Any new location would probably not be as suitable as the present site and would thus be the cause of impacts to users for the life of the project and perhaps longer.

34 It is recognized that booms cannot contain spilled oil in any but calm sea conditions. However, booms would be used in appropriate circumstances. Refer to the Response to Comment 126-Fisheries, 10.

35 Wildlife other than threatened and endangered species are discussed in the sections in Terrestrial Wildlife in Chapters 2 and 3 of the FES. The FES includes more detailed explanations of potential impacts to big game, fur bearers, game birds and other species.

36 Refer to the Response to Item 1 of the Fisheries Section Comment 126.

37 The concern identified in this comment has been incorporated into the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

38 Refer to the Responses to Comments 126-Eastern Clallam County, 5 and 6.

39 The Dungeness River has been included in the appropriate sections of the FES.

40 Refer to the Response to Comments 126-Fisheries, 1-4.

41 The information in this comment has been noted; however, it was not possible to incorporate the information into the revisions of the sections on Recreation.

42 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

43 There is no information which suggests that the noise of pumps would have any effects on migrating salmon.

44 Potential economic impacts on fisheries have been discussed in the section on Port-Economic Conditions in Chapter 3 of the FES.

45 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

46 The concern identified in this comment has been considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

47 The statement referred to does not suggest that all streams have uniform flow rates. It states explicitly that impacts would depend on streamflow characteristics. Flow rates of streams vary according to season and from year to year. It was decided that specific information about variations of flow would not be included in the ES, because it was not required to adequately identify potential impacts.

48 Refer to the previous response. Such factors as streamflow, stream gradient, size of armour layer, and concentration of fine-grained sediments below the armour layer would have to be analyzed for each stream crossing. For example, it is doubtful that much fine-grained sediment would be found in high gradient stream beds. Thus, the armour layer and sand would become re-established very rapidly and cause no adverse affects upon spawning fish and shellfish.

49 A sublethal effect would be any change in a behavioral pattern, such as feeding, mating, or reproductive success. No specific concentration for a given crude oil component can be equated to a given sublethal effect. Most experiments have been performed under controlled laboratory conditions. Thus, it is difficult to relate these experiments to "real world" conditions. Advection and diffusion would dilute soluble crude oil components. As a result, it may take years of low level, chronic exposure in the marine environment to alter a behavior pattern. This statement, of course, assumes the exposed organism has a long enough natural life span for sublethal effects to develop.

50 Refer to the Response to Comment 76-10.

51 Fisheries Resources are identified in the section on Aquatic Resources in Chapter 2. The table referred to has been deleted from Chapter 1 of the FES.

52 The section on Port-Recreation in Chapter 2 has been revised, and it does include a discussion of sport bottom fishing.

53 Refer to the Response to Comment 76-10.

54 The text has been revised in response to this comment.

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**CONT**

### FISHERIES

55 Only the larger streams containing 3 or more salmon species were included in the tables.

56 Potential impacts on fishery resources caused by hydrostatic testing are discussed in the section on Pipeline System Aquatic Resources. Also refer to the Response to Comment 43-2.

57 The bacteriacide has not been identified by the applicant. Data to support dilution needs was not supplied. Also refer to the Response to Comment 43-2.

58-61 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

62 There is no implication in the statement referred to that fish occur in equal numbers at all times. It is because of variables such as presence of fish that potential economic impacts cannot be reliably quantified. Refer to the Response to Comment 126-Fisheries, 6.

63 Refer to the sections on Marine Resources and Economic Conditions in Chapter 3 of the FES. Refer to the Introduction to the FES concerning the treatment of Canadian resources.

64 Refer to the Response to Item 1 of the Fisheries Section of Comment 126.

65 In this comment spring flooding appears to be confused with seismic and other geologic hazards (e.g., outburst floods and slope instability). The potential impacts from all these causes are discussed in the appropriate sections of Chapter 3.

66 Whether or not NPDES guidelines apply to these situations has not been determined.

67 The applicant has not provided details on chemical composition of the water.

68 This comment was considered in the revision of the section of Pipeline System Aquatic Resources in Chapter 3.

69 The comment refers to a discussion of potential impacts on soils. Potential impacts on wetlands and fish are addressed in the sections on Marine Resources and Aquatic Resources.

70 Currently available data does not permit an analysis of this detail to be made. It was determined that the potential impacts from sedimentation could be identified without this level of detail.

71 Since intake screen sizes have not been identified by the applicant, it is not known what size fish would be excluded from the pipe. The circumstances under which NTPC would shut down pumping activities are not known.

72 This comment was considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

73 The concern identified in this comment has been addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

74 Refer to the Response to Item 1 of the Fisheries section of Comment 126.

75 Fishery resources in Siebert Creek have been identified in Chapter 2. Impacts related to discharges have been addressed in the section on Port Aquatic Resources in Chapter 3. Potential mitigation measures are discussed in Chapter 4. There is no information available on the subject of possible restitution for the loss of aquatic resources.

### FOREST PRODUCTS

1 The potential financial impacts of loss of harbor log storage is discussed in the section on Port-Economic Conditions in Chapter 3 of the FES.

2 The details of the alignment of the pipeline right-of-way in relation to the existing BPA right-of-way are not known at this time. Potential impacts on existing land uses are discussed in the sections on Land Use in Chapter 3.

3 Potential impacts of the NTPC proposal on vegetation are discussed in the vegetation section of Chapter 3, which has been substantially revised for the FES. It does not specifically discuss seed orchards which would probably be most susceptable to impacts. From the information available it appears that seed orchards would not suffer any noticeable impact. See also the economics section of Chapter 3, for a discussion of induced industry.

4 The section on Port-Land Use in Chapter 3 has been revised with an expanded discussion of potential impacts of oil spills on logs stored in the harbor.

### GEOLOGY

1 The sections on Topography/Geology in Chapters 2 and 3 have been rewritten to be consistent with the change in NTPC's proposed route to Across Puget Sound. All subsections on seismicity have been revised to clarify issues raised in this and other comments.

2 NTPC proposes to bury the submarine pipelines between Ediz Hook and Green Point below anchor depth. No significant change in the configuration of the harbor bottom would be expected. The proposed project would not be expected to cause erosion of Dungeness Spit

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CONT

## GEOLOGY

because there is no evidence to suggest that littoral drift between Green Point and Dungeness Spit would be significantly altered by the project. Also refer to the Response to Comment 62-5. There is no indication that water would be injected into the soil as a waste disposal method. Available information indicates that soil instability would not be a problem at Green Point. The sections on seismicity have been rewritten.

3 Construction and operation of NTPC's proposed port facility would not be expected to have any significant impacts on deposition of geologic material. The submarine pipelines would be buried, and once buried, they would not be expected to cause any continuing alteration of the harbor bottom.

4 Most of the soils that would be disturbed by the proposed project at Green Point would be covered by permanent structures. Those that remain would be returned to near normal conditions and would be revegetated. Permeability which is to some extent dependent on cementation and porosity, should return to normal in two to three years.

5 There is no aspect of proposed project construction or operation which would be expected to increase the risk of a breach in Ediz Hook.

6 It is not known at this time whether or not the submarine pipelines would be removed at the time of ultimate abandonment of the project. That decision would be dependent upon pertinent considerations and federal, state and local regulations in effect at that time.

7 The types of fluids which could leak from construction equipment would be gasoline, diesel fuel, crankcase oil, transmission fluid, hydraulic fluids and engine coolants.

8 The cited figure shows a typical pipelaying plan. Detailed plans for pipeline burial in specific conditions would be developed later, if NTPC's proposed project is approved and implemented. The corridor studies have so far identified no areas with conditions which would be expected to present special problems to pipeline construction.

9 NTPC's proposed pipeline crossing of the Dungeness River is located on nearby flat terrain where outburst flooding is not considered to be a serious threat.

10 The surficial material is predominantly Everson Drift. The report by Shannon and Wilson, Inc.,(1978a) includes the available geotechnical data.

11 If the NTPC proposal is approved a detailed geotechnical investigation, considering such things as seismic risk, engineering loads, and slope stability, would be required.

12 The fill would come from material on site and spoil would be retained on site and sloped and graded to blend into the terrain. This has been clarified in the revision of the appropriate section of the FES.

13 NTPC has indicated that it would be committed to erosion control measures to prevent significant sediment from getting into Seibert Creek. NTPC has indicated that settling basins would be used on the site. No federal, state or local agency has indicated that it would monitor this aspect of the proposed project. There is no specific regulatory authority which would apply to monitoring erosion from the proposed onshore storage facility site. No agency with regulatory responsibility has yet indicated that a bond would be required for this or any other aspect of the proposed project. The potential impacts from sediment or aquatic and marine resources are discussed in the appropriate sections of Chapter 3.

14 NTPC's proposal for running the pipeline from the shoreline up to the storage facility site has been changed and various sections of the FES have been revised to be consistent with the current proposal.

15 Consultation with the Washington State Department of Natural Resources (Kurt Othberg, personal communication to Bill Holsheimer, April 10, 1979) has indicated that alteration of the bluff at Green Point would be expected to have little effect on the sedimentation rate for Dungeness Spit. Also refer to the Response to Comment 62-5.

16 Refer to the previous response concerning the relationship between Green Point and Dungeness Spit. There is no direct evidence that the bluff at Green Point is eroding at a rapid rate. The estimate of 3 inches per year by Shannon and Wilson (1978a) was based on historical records and topographic maps representing a 98 year period. The erosion rate of 20 to 40 inches per year, attributed to Mr. Keale in this comment, refers to areas 1 to 3 miles from Green Point consisting of different geologic material.

17 Details from the reports by Shannon and Wilson have been included only in so far as they were needed to adequately identify and analyze potential critical and significant impacts. Liquefaction under seismic conditions at Green Point would not be expected to be a problem because of the granular nature of the material. No significant limitations on weight bearing capability have been identified.

18 Potential groundwater impacts are discussed in the sections on Aquatic Resources in Chapter 3.

19 NTPC's proposal concerning Green Point Bluff and the launch ramp has been changed. Settling basins have been designed for maximum expected rainfall, based on historical records.

20 Considering a potential project lifetime longer than NTPC's proposed 20-year economic life does not improve the reliability of predicting geological events.

21 Refer to section IV of the Map Addendum.

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### GEOLOGY

22 Refer to section IV of the Map Addendum. Wetlands have not been considered to be significant geologic hazards. No unstable soils at Green Point have been identified.

23 Refer to section IV of the Map Addendum. Frequency and magnitude of landslides have not been calculated. NTPC has not proposed any specific measures to offset potential impacts from landslides. However, the change in the proposed route from Around Puget Sound to across the Sound would avoid some areas of potential landslide hazards in western Washington.

24 NTPC is committed to reclamation of oil contaminated soil. The method or combination of methods would depend upon the size of the contaminated area and the degree of contamination.

25 NTPC is committed to preventing the sediment from leaving the storage facility site. Most sediment would be caught in settling basins within the site. With the change in NTPC's proposal for ascending the bluff at Green Point, erosion rates with the project in place would not be expected to be significantly different from existing conditions.

26 Compression of water bearing layers of the subsoil by weight of the tanks would not be expected to alter water courses or to aggravate erosion problems along the bluff. The report by Shannon and Wilson indicates that loads imposed by the tanks could be carried by the soils with a high factor of safety. Tank settlements of a few inches are predicted and, due to the granular nature of the soils, would be expected to occur as loading is applied (1978, pages 31-32).

27 Refer to the Responses to Comments 126-Geology, 14-15.

### HARBOR MANAGEMENT

1 Refer to the Response to Comment 27-1.

2 The oil spill, fire and explosion risk analyses discussed in Chapter 3 of the FES, and the impact assessments, consider the potential effects of tanker casualties both in-transit and at-berth.

3 NTPC's current proposal is to bring bunker fuel from California by tanker and to store it in a bunker fuel barge permanently moored at Ediz Hook.

4 Specific possible future uses of the port facilities cannot be anticipated at this time. The statement referred to in the comment is intended only to recognize the likelihood that post-project, alternative uses would probably develop.

5 There are designated anchorage areas in the Port Angeles area. Port Angeles harbor is currently used as an anchorage for large tankers. Potential impacts from anchoring large tankers in the harbor are discussed in the FES.

6 The section, table and map referred to have been revised in the FES. The word pier is used since that was used in the referenced source document. Not all areas are labeled on the map, only those areas referred to in the text.

7 It is not within the scope or function of the ES to determine possible locations of a rail barge slip in the Port Angeles Harbor.

8 The FES has been revised to show 1978 vessel traffic statistics for the Strait. The most recent data for Port Angeles vessel traffic is 1977. The table showing the Port Angeles vessel traffic was mistakenly labeled 1978, when in actuality it was 1976 data. The U.S Coast Guard was the data source for the vessel traffic in the Strait and the U.S. Army Corps of Engineers was the data source for Port Angeles harbor traffic.

9 Tug boat anchorage sites are not known. According to NTPC's current proposal, fuel barges would not be used. Refer to the Response to Comment 126-Harbor Management, 3.

10 Potential impacts caused by tanker queuing and increased vessel traffic are addressed in Chapter 3 of the FES.

11 Vessel movements and anchorage areas would be regulated by the U.S Coast Guard.

12 The risk of damage to vessels trying to leave the harbor, in the event of a fire, might increase. The amount of increased risk would depend upon many factors including the number and size of ships, the period of time the ships would be leaving the harbor, and the extent and location of the harbor fire.

13 Refer to the General Response to Comment 126 and to the Response to Comment 126-Harbor Management, 11.

14 The fire and explosion risk analyses presented in the FES do include combined total vessel traffic. Projecting traffic seven years into the future does not significantly alter the estimates made in the risk analyses.

15 The estimated fire and explosion frequencies have been revised in the FES. Since the analyses presented in the NTPC application to EFSEC and in the FES were performed independently, it is not to be expected that the results would be identical.

16 The source of the fire and explosion risk analysis is the Oceanographic Institute of Washington (1979). Specific data sources are identified in that report. Traffic separation distances would be established by the U.S. Coast Guard.

17 Refer to the Response to Comment 126-Harbor Management, 2.

18 Refer to the Response to Comment 126-Geology, 6.

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CONT.

## HARBOR MANAGEMENT

19 This information has been included in the FES.

20 The information cited (from the ARCO publication prepared by the U.S Army Corps of Engineers) was the best available, and no reason was found to suspect bias of the information. The actual distribution of vessel traffic between Canadian and U.S. traffic is unknown. The data show about 5 times as many freighters as tankers, and their distribution between Canadian and U.S. ports is also unknown. Data was obtained from the Vessel Traffic System, although it pertains to areas outside its regulatory boundaries.

21 The average day figures presented in the table in the section on Port-Economic Conditons in Chapter 2 were derived by dividing total annual traffic by 365.

22 The data which is questioned in this comment has been reviewed and is considered to be reliable.

23 The figures referred to in this comment represent vessel movements.

24 Data for U.S. small boat ownership similar to the Canadian small boat ownership data was not presented in the table in the section on Port-Economic Conditions in Chapter 2 because it was not available.

25 The section of the text referred to in this comment has been revised.

26 Intra-harbor movements which represent almost entirely rafted log movements were omitted from the waterborne commerce data to make the data more representative of vessel traffic in other ports. 1977 data was not available for the DES, but has been included in the FES. Data for fish was considered too minor to be separately identified in the table. Fresh fish (except shellfish) totaled 965 tons in 1977, and shellfish (except prepared) totaled 8 tons. Prepared fish and shellfish amounted to 14 tons, mainly foreign imports. Crude petroleum imports were excluded because it was known that they were not actually landed at Port Angeles, and they were therefore regarded as a distortion of the data. Vessel traffic data for Port Angeles harbor is presented in the section on Port-Transportation and Utilities in Chapter 2.

27 The erroneous statement has been deleted from the FES.

28 There is no inconsistency between the two statements referred to in the comment. Note that the first reference is to that section of the DES (which has been deleted from the FES) which described the probable future environment without the proposal, while the second reference is to a section of the DES which described potential impacts of the proposal. The potential economic impacts cannot be reliably quantified but they are discussed in the FES.

29 Limitations in development of future boat launch facilities may be a problem; however, it has not been determined to be a potentially significant adverse impact either with or without NTPC's proposed project.

30 Detailed abandonment procedures are not known; therefore, potential impacts must be identified in terms of the possible alternative procedures. Post-abandonment impacts either on or caused by the submarine pipelines would not be expected to occur.

31 Potential impacts of the NTPC proposal are discussed in relation to existing conditions within the community.

32 This comment appears to reflect a misunderstanding of what was stated in the DES. The statement in the ES is that no other usable and presently leaseable log storage areas have been identified.

33 The potential impacts of the NTPC proposal on existing operations by Crown Zellerbach and ITT-Rayonier are discussed in several sections of Chapter 3 of the FES. Potential impacts have been identified in combination with existing conditions. All impacts have been assessed for both initial (709,000 bpd) and ultimate (933,000 bpd) throughput proposals.

34 Discussions of specific relocation sites have not been added to the FES. If the NTPC proposal is approved and implemented, relocation would be a matter of negotiation between NTPC and the owners of the facilities. The proposed NTPC project cost estimates in Chapter 1 of the FES include an item for relocation of facilities.

35 Potential new site locations for the pilot station are not known. The point of the statement referred to in the comment is that relocation to any site other than the Coast Guard base (which could be the new site), would have impacts on travel distances.

36 Most of the questions raised in this comment have already been responded to. For the others, the NTPC proposal would not prevent continued use of the log dump, the Foss Tug could continue to operate during each phase of the NTPC proposal, and the potential restrictions on Crown Zellerbach's operations have been identified and described to the extent possible with available information.

37 The comment refers to a summary paragraph which has been deleted from the FES. Potential oil spill impacts to harbor industries are discussed in Chapter 3 of the FES.

38 The definition of the June-September tourist season is appropriate in terms of vehicle traffic volumes. The FES has been revised to indicate that NTPC proposes to install the submarine pipeline from Ediz Hook to Green Point during the winter season, and to make it clear that method of installation has not yet been determined. Construction activity might cause minor delays to the Port Angeles-Victoria ferry, but no other impacts to it are anticipated.

39 The discussion of potential impacts on Coast Guard air operations has been revised and expanded in the FES.

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CONT

## HARBOR MANAGEMENT

40 The section on Port Economic Conditions in Chapter 3 has been revised to consider relocation impacts.

41 Potential impacts on the social aspects of recreational activities are included in the sections on Port-Social Conditions. The significant economic impacts are discussed in the section on Port-Economic Conditions in Chapter 3.

42 The separation distance between tankers and other boats during unloading operations would be determined by the Coast Guard. It is expected that there would be restrictions on other harbor traffic.

43 Most of the questions raised in this comment have already been responded to. For the others, both the Port of Port Angeles and the Chamber of Commerce were contacted; however, specific identification and descriptions of possible harbor uses have not been included since they would not alter the impact analysis in any definitive way.

44 The issues raised in this comment are addressed in the General Response to Comment 126, in the specific responses above in this section, and in Chapter 3 of the FES.

45 Significant short-term uses, their effect on long-term production and the trade-offs have been addressed in the revision of Chapter 6.

46 The text has been revised. The analysis on which these statements are based appears in the section on Port-Economic Conditions in Chapter 3. The study referred to in the comment was considered in that analysis.

47 This comment refers to pages and sections that do not exist in the DES, therefore, no revision or response has been made.

48 The estimate of 511 tanker port calls is correct. The number of port calls would be lower if all deliveries were to Port Angeles because fewer, larger tankers could carry the same volume of crude oil now being delivered to the Puget Sound refineries with smaller tankers.

49 Alternative sites for the existing facilities which would have to be relocated have not yet been identified.

50 NTPC has apparently met with The Salmon Club and indicated that NTPC anticipated no problems accommodating the various needs associated with the fishing derbies. However, there are apparently no written commitments concerning these issues at this time.

51 Refer to paragraph 1 of the General Response to Comment 126.

52 NTPC has not amended their proposal to BLM to include the placement of the berths further east on Ediz Hook. NTPC did amend its application to EFSEC to include the eastward placement as a possible alternative location for the berths. Because it is not part of NTPC's proposal, it has not been addressed in the FES.

53 Electrical requirements for construction of the port facility would be about 0.02 percent of the City Light Department's 1977 sales. Requirements for construction of the onshore storage facility would be about 24,500 KWH per month. This would amount to about 0.08 percent of Clallam County PUD's 1977 sales.

## LAND USE

1 This table has been revised in the FES to include Clallam County.

2 The cited CFR reference could not be located; however, the question of conformance is addressed in the ES. This determination would be made by EFSEC.

3 The cited statement refers to Green Point. The city comprehensive plan is discussed elsewhere.

4 The cited paragraphs address construction and abandonment phase impacts. The issues of concern are addressed as operation phase impacts in the appropriate sections of Chapter 3 of the FES.

5 This information is included in Chapter 1 of the DES and FES.

6 The cited statement refers to the section on pipeline system impacts. The incompatibility of the proposed onshore storage facility with the Clallam County Comprehensive Plan is discussed in the section of Chapter 3 dealing with Land Use in the Port and Onshore Storage Facilities areas.

7 NTPC's current proposal for bunker fuel supply and storage is included in Chapter 1 of the FES.

8 The photographs and drawings are intended to illustrate facilities and construction activities in a general way. They are not intended to illustrate NTPC's proposal nor actual impacts. Potential impacts are discussed in the appropriate sections of the text.

9 A more specific description of land use near the onshore storage facility was not needed for impact assessment. More recent land use data, if available, could not be located.

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## LAND USE

10 The specific terms of the program relate to other resources, therefore, they are not included.

11 The map has been revised in the FES.

12 The social aspects of recreational activities are addressed in the sections on Port-Social Conditions under Social Well-Being and Quality of Life.

13 The Dungeness River has been added. The visual resources rating system used in the ES is explained in the introduction to the section on Port-Visual Resources in Chapter 2. The text has been reviewed and the use of the rating code and verbal descriptions appeared to be clear and consistent.

14 Rural-residential category is not used in the table as there is no clear definition of it as a category. The narrative indicates residential use is common in forested and agricultural areas.

15 This section has been revised. More specificity is not possible in this section because there are too many unknowns.

16 The 140 acres includes both phases.

17 Refer to the Response to Comment 126-Land Use, 8.

18 The land use section of Chapter 3 has been revised in the FES.

19 The assumption is based on oil supply projections. Other possible uses of the pipeline could only be based on conjecture at this time.

20 The impact description referred to has been revised in the FES.

21 Ancillary improvement impact on agricultural land is not known. The construction rate is realistic.

22 Potential impacts from storage areas are addressed in the subsection on the construction phase. Slash pile fire hazards are addressed in the FES.

23 This section has been revised to reflect the maximum proposed throughput of 933,000 bbl.

24 The purpose of the map is to show generalized land use categories. Commercial uses have been grouped with other urban uses. A map of this scale cannot show specific sites. Specific land uses are shown on other maps where pertinent to impact analyses.

25 The information mentioned in the comment is not included because the section referred to (which has been deleted from the FES) was a discussion of the probable future environment.

26 Smog is not mentioned in this section because it has not been identified as a significant potential unavoidable adverse impact.

27 NTPC proposes to clear approximately 140 acres at the onshore storage facility site, not 292 acres. Many of the taller trees left standing at Green Point would be taller than the proposed storage tanks. While the storage facility would be visible from Hurricane Ridge, the distance of more than 10 miles would mean that the storage facility would appear to be very small and would occupy a minute portion of the view. The primary intrusion on the view from the Strait would be caused by the pipelines ascending the bluff from the shoreline. In addition there would be a break in the continuity of bluff-line vegetation where the pipelines would run in from the bluff to the storage facility. A portion of the storage facility might be barely visible through the break in vegetation from some distance out in the Strait. It would probably not be significantly visible from Ediz Hook, Dungeness Spit or British Columbia because of distance, trees, and the differences in elevation. The potential impacts of the project on property value are discussed in the sections on Economic Conditions. The proposed project would not be expected to have significant visual impacts on the efforts of downtown merchants to improve the visual atmosphere of the downtown area. The visual impacts of the proposed port facility would be both positive and negative. Some people would probably enjoy watching the harbor activities associated with the port facility and some merchants would probably benefit from that. Other people would probably choose to avoid viewing the port facility.

28 The comment refers to construction impacts at the onshore storage facility site, which is approximately 6 miles from the Port Angeles harbor area.

29 Emissions from the onshore storage facility would not affect visibility during the operation phase. All potential impacts on visibility during operation of the project would be attributable to the port facility.

30 The sentence referred to in the comment has been revised. Secondary effects are likely to be significant only for adjoining residential land use. Vigorous land speculation would not be expected. Strip development has already occurred along U.S. Highway 101. The onshore storage facility would not employ enough people to induce significant commercial development along the Old Olympic Highway. Air pollution effects would not be expected to cause land use changes in the vicinity of the onshore storage facility.

31 A considerable amount of land speculation has already taken place in the area. The NTPC proposal is not expected to add significantly to this problem.

32 Potential impacts of the onshore storage facility on nearby property have been discussed in the sections on Land Use and Economic Conditions in Chapter 3. These discussions were revised for the FES.

33 Refer to the Response to Comment 126-Land Use, 30.

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## LAND USE

34 It is not expected that other industries would locate near the onshore storage facility. The discussion of the possible attraction of other petroleum-based industries has been expanded in the section on Port-Economic Conditions in Chapter 3 of the FES.

35 Refer to the Response to Comment 86-10

36 This potential impact is identified in Chapter 3 of the FES. Details on coordination of construction would be worked out at a late stage of project development, if the proposal is approved.

37 The section referred to has been revised in the FES to include ownership impacts. Other potential impacts mentioned in the comment are identified in other, appropriate sections of the FES.

38 An estimate of sabotage potential is beyond the scope of the ES. The potential impacts from fire, explosion and oil spill would be essentially the same regardless of cause.

39 Specific data of this type is not available. It is not expected that the limited influx of workers for the proposed NTPC project would cause any losses of timber land to housing.

40 The statement referred to in the comment was about the methodology of determining types of impacts, not a description of impacts. The description of impacts does describe incompatabilities, necessary relocations and future restrictions.

41 The project description states that facilities might be dismantled. County planning and zoning decisions could protect against the development of future land uses that might be considered undesirable.

42 Most of the significant potential impacts would occur during the initial phase of construction. It is not expected that there would be any distinct additional impacts on land use during the second construction phase.

43 Current expansion plans for which information was available are discussed in Chapter 1.

44 The figures have been corrected in the FES to indicate that the analysis is based on the assumption of ownership of 242 acres with approximately 140 acres being cleared.

45 Population data in the FES, except where noted otherwise, is from: Washington State and County Population Forecasts by Age and Sex, State of Washington, 1978.

46 Data analyzed in the FES indicates that, while housing would be strained during the construction phase of the proposed project, most of the anticipated in-migrants could find accommodations in houses and motels. No significant adverse impacts are foreseen on housing facilities.

47 Due to the relatively brief period during which the construction phase of the proposed project would occur, it is unlikely that rent increases would affect local long-term residents. Newcomers would pay high prices. Negative effects on the State Department of Social and Health Services could occur, but there would be no significant adverse impacts.

48 It is beyond the scope of the ES to attempt to resolve legal questions including the question of whether or not NTPC's proposed tank farm at Green Point would be prohibited by the 1977 Amendments to the Marine Mammal Protection Act of 1972.

49 The paragraphs referred to in the comment have been deleted from the FES.

50 FWS requested that NTPC provide a plan for mitigating potential impacts to bald eagles. NTPC replied by proposing to leave roosting trees standing and to leave a buffer zone between the edge of the bluff and the storage facility site. BLM has determined that there would be adverse impacts on bald eagles even if NTPC implemented those two measures. It is expected that bald eagles would discontinue their use of the Green Point area if the onshore storage facility is built there. FWS is currently revising their official biological opinion in response to the changes in the NTPC proposal.

## LAW ENFORCEMENT

1 Estimates of the number of people moving to Port Angeles and Clallam County are presented in the section on Port-Economic Conditions in Chapter 3. Speculation about the "kind" of people who would move into the area is beyond the scope of the ES. Increases in traffic congestion problems, and in public disturbances could occur but would not represent a significant adverse impact. Because of the relatively brief duration of the construction phase of the proposed project an increase in the incidence of minor and petty crimes is not regarded as a significant adverse impact.

2 As discussed in the FES, the number of police officers at the present time is below state law enforcement standards. Additional officers are warranted regardless of the decision on implementation of NTPC's proposed project. It is not anticipated, therefore, that the needed law enforcement personnel would be hired for only a brief (e.g., 18-month) period.

3 No significant increase in the unemployment rate is anticipated at the end of the construction phase of NTPC's proposed project. No significant adverse impacts on law enforcement services are expected from tanker crews. NTPC would be responsible for providing protection for company property.

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CONT

## LAW ENFORCEMENT

4 Population projections indicate the need for an increase in the number of law enforcement personnel. It is not anticipated the size of the force would be reduced after the end of the construction phase of the proposed project.

5 Increase in the number of traffic congestion problems is not expected to be a significant adverse impact.

6 Increase in the incidence rate of public disturbances is not expected to be a significant adverse impact.

7 Project related contributions to the existing parking problems on Ediz Hook would not be expected to be a significant adverse impact.

8 NTPC would be responsible for providing protection for its property and equipment.

9 The only potential population increases that can be reliably estimated are those related to construction. An attempt to anticipate potential home relocation decisions by tanker crew members would be extremely speculative.

10 These concerns are included in the sections on Social Well-Being and Quality of Life in the sections on Port-Social Conditions.

11 The projected needs for police and harbor protection presented in the comment are based on expectations of a large population increase and the assumption by the city of existing Coast Guard functions. The population increase would be about 380 persons rather than the 1500-2100 suggested in the comment. The Coast Guard facilities would not have to be relocated because of NTPC's proposed project; however, if for any reason they were relocated, the Coast Guard would continue to perform those functions with which it is charged by law. Increased police protection needs are discussed in the section on Port-Social Conditions in Chapter 3. Population increase and fiscal conditions are discussed in the section on Port-Economic Conditions in Chapter 3.

12 Potential impacts of the project on transportation systems, the population of Port Angeles, social services and from possible oil spills are discussed in the appropriate sections of the FES. It would be the responsibility of NTPC and/or its contractors to provide security for its property and equipment. Certain crime incidence rates would probably increase with the increase of population, but it is not expected that this would be a significant adverse impact. Any attempt to estimate sabotage potential or the number of other crimes rooted in ill feelings toward NTPC would be highly speculative and is beyond the scope of the ES. At the present time the number of Clallam County Sheriffs Office (CCSO) patrolmen in relation to population is low. To meet the desired ratio of 1.5:1,000, 16 additional personnel are needed. Population growth projections for the county, without the project, indicate that there would be a continuing need for CCSO staff increases. The potential additional need caused by NTPC's project would not be a significant adverse impact.

13 Social services in Sequim and potential impacts on them are discussed in the sections on Social Conditions in Chapters 2 and 3. Project related population increases are discussed in the sections on Economic Conditions.

14 A construction staging area would be located near Sequim. The exact location is not known at this time, though it would probably be along a railroad right-of-way. The staging areas would be in operation for the approximate 18 months of the construction period.

15 The sections of the FES on Social Conditions have been substantially revised. Refer to Chapter 3 in particular for a discussion of potential project related impacts. Refer to the General Response to Comment 126 concerninig the current status and available detail of NTPC's proposal plans.

16 Most of the issues raised in these comments have been addressed in the responses to earlier comments in this section. Potential economic impacts are addressed in the section in Chapter 3 on Economic Conditions. Abandonment proposals, as they presently exist, are described in Chapter 1. The proposed project would not be expected to have any significant influence on the growth of the criminal justice system since the construction phase would be a relatively brief period.

## MEDICAL

1 The locations of the hospitals and ambulance information are provided in the Social Conditions sections of the FES.

2 Potential noise impacts on the Olympic Memorial Hospital are given in the table of Estimated Noise Levels During Construction of the Port Facility in the section on Port-Noise in Chapter 3 of the FES. Washington state noise standards are given in the section on Port-Noise in Chapter 2. Calculations of concentrations of pollutants indicated that the concentrations would not exceed the standards at any location. Therefore, no adverse health effects would be anticipated.

3 The sections on Social Conditions have been substantially revised for the FES. However, mental distress has not been identified as a potentially significant adverse impact of the proposed project.

4 These comments apparently refer to sections of NTPC's application to EFSEC, not to the DES. The FES does include a discussion of disaster emergency plans, and a new section on Oil Spill, Fire and Explosion Risk analysis.

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**CONT**

## MEDICAL

5 As mentioned in the FES, medical care personnel and facilities would be capable of handling project-related injury cases.

6 Disaster emergency plans are discussed in the FES. The statements referred to concerning accident rate increases have been deleted from the FES and the discussions of Social Conditions have been extensively revised.

7 The sections on Social Conditions in the FES have been revised to be more consistent than they were in the DES. The references to such things as grocery stores have been deleted. Since medical facilities and personnel would be adequate to handle normal construction and operation injuries, no significant adverse impacts to medical facilities are anticipated.

8 Specific quantities cannot be specified since impacts outside the facility boundaries would occur only in the case of a multiple failure, which would not necessarily be related to amount oil involved in the incident. The assumption about abandonment is appropriate since specific abandonment procedures are neither proposed by NTPC nor prescribed by any agency. If abandonment occurs, procedures would be determined in response to pertinent considerations and applicable regulations in existence at that time. The conflict between statements which is cited in the comment cannot be identified.

9 There is no plan to redress residents at Green Point for excessive construction noise. The state of Washington DOE was contacted regarding the possibility that state noise standards may be exceeded. The DOE told BLM that any plan to enforce state noise standards would have to be coordinated with the county since the DOE does not have enough manpower of its own. BLM sent a letter to Clallam County, dated August 31, 1978 asking if the county would be willing to draw up any stipulations to control construction noise and make any plans to enforce state noise standards. However, no reply has been received. In the absence of cooperation from local officials, there can be no assurance that noise standards would be met. Monitoring of health effects would be at the discretion of the local officials. Any health problems which might be caused by noise would not be expected to represent an adverse impact on available medical facilities or personnel.

The state of Washington noise standard for noise in a residential area due to industrial activities is 60 dBA during the daytime and 50 dBA at night, with construction noise exempted. Existing sound levels at the hospital ground measured between 54 and 63 dBA during the day and between 50 and 59 dBA at night. During piledriving activities associated with construction of the port facilities, daytime noise levels at the hospital grounds would increase between 1 and 4 dBA. However, it is unlikely that the noise increase inside the hospital would be very noticable. During port facility operation, the increase in noise levels at the hospital grounds would be minimal.

10 The period of time for each measurement was about 15 to 20 minutes. The 10 db correction factor is commonly used in defining night sound levels to take into account greater sensitivity of persons to noise levels. Without the correction, 24-hour noise levels would be lower. Noise levels as a result of the project are given in the tables in the section on Port-Noise in Chapter 3.

11 The new section on Oil Spill, Fire and Explosion Risk Analyses in the Port section of Chapter 3 of the FES discusses the many variables which can cause different damage effects from explosions. There is no way to anticipate who would be financially responsible for explosion damages. It would be a legal issue that would be determined according to the specific circumstances. Generally, damages can be assessed against the party or parties responsible for the event. The discussion in the ES on contingency plans and fire fighting equipment is based on information provided by NTPC. Discussions of potential impacts from fire and explosion have been revised throughout Chapter 3 of the FES.

12 All information which has been reviewed suggests that construction workers who provide their own accommodations for jobs which last an extended period of time would be using vehicles which require complete electrical and waste disposal hook-ups. Year-round construction workers would therefore not be expected to use seasonal campsites. Regulation of campsite use would be a local responsibility.

13 Potential impacts on groundwater are discussed in the section on Aquatic Resources in Chapter 3. Refer to the Response to Comment 51-6 which contains an explanation of why potential impacts of specific spills are not discussed. It is beyond the scope of the ES to speculate on what the possible responses of specific homeowners might be.

## OIL SPILLS

1 A recent study by Brown and Associates (1979) indicates that an anchor weighing 35,000 pounds, if dropped in water 180 feet deep, would penetrate 3.7 feet into sediment with a density of 115 pounds per cubic foot.

2 The sections on Biological Components of Marine Resources in Chapters 2 and 3 have been completely rewritten. The marine resources maps have been revised and new maps have been added. Information provided by NOAA-MESA and PMEL on oil spill trajectories and drift card studies has been incorporated into the FES.

3 Historical records are reports of earthquakes since 1827. As detailed seismic records have only been kept since the 1940's, there is insufficient data to give a specific, numerical probability of a large magnitude earthquake occurring during the next 20 years. However, as there have been only 5 large earthquakes (Modified Mercalli VIII or greater) since the 1860's, the probability of another such event occurring in the near future appears low.

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## OIL SPILLS

4 The degree of damage to the pipeline would depend on the magnitude of the slope failure; a small failure would cause very little if any damage, while a large one could rupture the pipeline and cause an oil spill. It is presently beyond the capability of the geological sciences to give a numerical probability of a slope failure occurring during a specific time period. However, a study of the geology - type of material, degree of compaction, slope steepness, etc. - could give information about the relative stability of a slope. Although a detailed geotechnical study of the bluff at Green Point has yet to be done, the relatively well compacted material and a lack of apparent landsliding would seem to indicate a low probability of slope failure.

5 Refer to the Response to Comment 43-2 concerning hydrostatic testing. Potential impacts from testing are discussed in the sections on Aquatic Resources. Discharges from the oil/water separators would also be regulated by NPDES permits from EPA.

6 Potential contamination of marine resources and potential impacts on Protection Island, Sequim Bay, Discovery Bay and Admiralty Inlet are discussed in the Marine Resources sections of the FES.

7 Spill risk data for bunker barges was not available when the DES was prepared. It has been included in the FES. Note, however, that since publication of the DES, NTPC has changed its proposal to providing bunker fuel by tanker to a storage barge permanently moored near the tanker berths.

8 The final statistical values for frequencies of magnitudes for existing, incremental and combined risks are presented in the FES.

9 No 95% confidence interval has been set on the oil spill trajectories, since precise estuarine flow data was not available for all locations. Some information on estuarine currents was available and used for the FES.

10 Historical patterns are the only reasonable basis for the risk analyses. However, the patterns will change with changes in technology, variation in the quality of regulation of tanker movements, changes in traffic volume, and other factors; and as the patterns change, the risks will change.

11 The exposure variable was determined to be statistically sound.

12 The data sources used for the pipeline spill risk analyses do not report pipeline throughput, only the number of ruptures.

13 There is a discussion of NTPC's draft contingency plan in Chapter 1 of the FES. If the NTPC proposal is approved, the Department of Transportation would require that a contingency plan be prepared, reviewed by government agencies and approved prior to the start of operation of the system.

14 Existing, incremental and cumulative risks are presented and discussed in the FES.

15 Refer to the Response to Comment 126-Water Quality, 2 for a discussion of submarine pipeline spills and leak detection.

16 The information in the paragraph referred to in the comment pertains to water quality. Impacts to fish and birds are discussed in the subsections on Biological Components of Marine Resources.

17 Quantities cannot be reliably estimated. Most of the reports of sublethal effects are from laboratory experiments and are difficult to relate to real world conditions. The concentration of crude oil components in prey fish would be much less than what birds would ingest directly from their plumage.

18 The ES states that a large spill (in excess of 10,000 barrels) would likely affect shorelines in the Strait of Juan de Fuca. Spills of smaller magnitude occurring at or near the berthing facilities might cause adverse impacts to adjoining land uses. The ES does not state or imply that a less than catastrophic spill of 10,000 + barrels might not have an impact on land uses.

19 Refer to the Response to Comment L-6-66.

20 Refer to the Response to Comment L-6-69.

21 Refer to the Response to Comment L-6-71.

22 It is correct that the limited liability contingency funds would not cover the full costs of a major catastrophic spill. However, losses not reimbursed by the parties responsible for an oil spill are normally considered a social cost to be borne by society at large. This has historically been true for natural disasters (such as hurricane relief programs) or man-made disasters (such as the collapse of the Teton Dam). The ultimate incidence of this cost would depend on the extent of governmental aid to those suffering direct losses. If the spill were the result of the actions or non-actions of private industry (as distinct from a natural disaster or governmental action), private industry would be liable for the damages incurred.

23 In the data used for spill risk analyses in the ES there was no distinction between pipeline leaks under streams and on land. BLM was not able to find any information pertaining to this question. Note that in the FES the pipeline spill risk has been recalculated to 0.22 spills for the 20 year period.

24 The probability was not stated as a 31 percent chance. The DES stated that the expected occurrence rate would be 0.31 spills for the 20 year period (or approximately 1 spill every 64½ years). Note that this figure has been recalculated in the FES to be consistent with NTPC's current proposal. The FES figure is 0.22 spills for the 20 year period, or approximately 1 spill every 91 years.

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## OIL SPILLS

25 The word "subtle" is used to mean "hard to detect." Chronic spills would not be expected to cause drastic changes.

26 The two risk analyses produced different results because different data bases and different years of records were used. The FES contains a new section on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 which presents substantially more information on explosion risks than was in the DES.

27 The BLM risk analysis indicates the possibility of an in-transit spill of more than 10,000 barrels at once in 68.2 years and of a major at-berth spill once in 195 years.

28 All tanker traffic was considered, regardless of flag. Traffic between Port Angeles and Victoria was not specifically addressed. In the risk analyses the frequency of spills follows a Poisson distribution while spill rates follow a normal distribution.

29 The word "casualties" in the context referred to in the comment meant "incident" and not human injuries or fatalities. To eliminate the confusion the word has been changed to "incident" in the FES.

30 The existing oil spill risk for pipelines in the greater Puget Sound area is one spill equal to or greater than 2.4 barrels every 1.19 years. The risk for an onshore/offshore pipeline from Port Angeles to North Bend is one spill equal to or greater than 2.4 barrels every 5.2 years, with a pipeline throughput of 933,000 bpd.

31 Refer to the Response to Comment 27-40.

32 Note that the text explains that the figures represent oil spill risk for the combined onshore and offshore pipeline options.

## SCHOOLS

1 The FES contains accurate data concerning schools, numbers of students and potential increases that could be caused by NTPC's proposed project.

2 On the basis of the data presented and analyzed in the FES, it is not anticipated that there would be any significant adverse impacts.

3 These concerns are recognized in the FES. However, it does not appear that the potential impacts would be significant.

4 These issues are addressed in the sections on Social Conditions in the FES and in the earlier responses to the comments in the "Schools" section.

## SOCIO-ECONOMICS

1 Refer to the General Response to Comment 126 concerning details of the NTPC proposal and possible construction work force. The various potential impacts of abandonment are discussed in Chapter 3. Neither NTPC nor any agency has indicated any plan or proposal to establish or require a trust fund or its equivalent.

2 The section on Port-Transportation and Utilities in Chapter 2 has been revised to mention the damage to the Hood Canal Bridge. The potential impacts on the NTPC proposal are not discussed in the FES since alternative transportation networks do exist and since the bridge is going to be repaired.

3 Material from the Clallam County Overall Economic Development Plan has been included in the FES.

4 Commercial fisheries catches are reported by catch area rather than by landing point.

5 Personal income includes retirement income and social security benefits. The table on Personal Income in the section on Port-Economic Conditions in Chapter 2 has been revised.

6 The statement was incorrect and has been deleted from the FES.

7 There is little information available to make any projections over such a long time span. However, the BLM has made a more detailed study of future industrial potential based on such factors as geographic location, economic feasibility, and governmental control factors. Based on the conclusions reached, it is not likely that there would be major industrial expansion in the area. For a more detailed discussion of the problem, see the section on Port-Economic Conditions in Chapter 3 of the FES.

8 Data from the Clallam County Overall Economic Development Plan were incorporated into the FES.

9 The future environment section has been deleted from the FES. The sections on Port-Economic Conditions in Chapters 2 and 3 have been extensively revised, and the potential impacts of the NPTC project on future industrial expansion have been discussed.

10 It is recognized in the section on Port-Economic Conditions in Chapter 3 that the storage facility may adversely affect some property values in its vicinity, but no assessment has been attempted. Any such impacts would not be compensated.

11 These potential impacts are discussed to the extent possible with available data in the appropriate sections of Chapter 3.

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**CONT**

## SOCIO-ECONOMICS

12 The sections on Port-Transportation and Utilities in Chapter 3 has been revised to more thoroughly discuss the potential impacts of the effects of the NTPC proposal on the Coast Guard Station.

13 Fiscal Conditions are discussed in the revised section on Port-Economic Conditions in Chapter 3. The increased costs of providing public services are described there.

14 The details of NTPC's proposed construction schedule are presented in Chapter 1. The basic construction period would be 18 months, followed by testing period which would partially overlap with the construction period. Some impacts would extend beyond those proposed periods of time. In Chapter 3, potential impacts are discussed in terms of whatever lengths of time they would occur.

15 Increases in the property tax base resulting from the addition of pipeline property would have positive impacts on all segments of the community through reduced tax burdens. While proposed tax changes might alter local revenues, they have not been considered an impact of the project.

16 The text has been revised.

17 The text has been revised to provide further explanation and support of the statements made.

18 The method of estimating induced employment is explained in the section on Pipeline System Economic Conditions in Chapter 3.

19 The method of estimating local employment is explained in the section on Pipeline System Economic Conditions in Chapter 3. Local workers hired for the construction work force who were already employed in the community are presumed to be replaced in their former job by another worker, thus, the additional employment in construction and other activities represents an overall increase in employment.

20 The section on Port-Economic Conditions in Chapter 3 has been revised to clarify the discussion of operation phase employment impacts.

21 The discussions of tourism and recreation have been revised. To the extent that tourism is interrelated with recreational use of areas, potential impacts from an oil spill are considered moderate and for a relatively short period of time (one or two months). Recreational shellfish collection could be affected for a much longer period of as much as 4 to 10 years. However, tourists usually come to experience a range of activities, of which shellfish collection would be only one, and, generally, not the major activity for tourists. The extent of damage would be highly dependent on time of year, sea conditions, type of shoreline, and amount of oil spilled.

22 The section on Port-Economic Conditions in Chapter 3 has been revised to more carefully explain the economic impact analyses.

23 Biological impacts on Marine Resources are discussed in the Marine Resources sections of Chapter 3. An effort was made to quantify these impacts in economic terms but available information was inadequate to permit the development of reasonable estimates. The information presented in the sections on Economic Conditions in Chapter 3 is considered to convey the general nature and magnitude of the potential economic impacts. The text indicates that substantial losses might be sustained in shellfish fisheries, but salmon and bottomfish would probably be little affected.

24 Fishermen could claim direct economic losses from the parties responsible for an oil spill. The text has been revised to clarify the discussion of this issue.

25 Reduced profitability in this case should not reduce employment. To reduce employment would reduce profit still more. The power and air quality impacts are not considered to be real constraints on existing industry. It is not contemplated that power to existing industry would be curtailed. The air quality impacts would not significantly affect existing industry operation.

26 The revised estimate of additional personal income is $29 million for Clallam County. It refers to total construction payrolls (less social security contributions) and the wages and profits of other individuals in the local area. It is further discussed in the section on Port-Economic Conditions in Chapter 3. Refer to the section on Pipeline System Economic Conditions in Chapter 3 for the basis of the estimate and the way in which it was used in determining the economic impacts of construction.

27 The text has been revised to explain estimates of rental price increases.

28 The available data on housing indicate that most houses in Clallam County are owned by inhabitants. An increase in rents would affect the small minority of people who rent or lease houses. There would be negative affects on this group, but the adverse impacts would not be significant in terms of the type of analysis used in the FES.

29 Special camping areas would be provided if no other housing options were available, and only because the pipeline would be crossing forest land. It is not an automatic policy, but rather would be decided on a case by case basis. All costs required to set up the area with adequate sanitary and other facilities would be borne by the party using the area.

30 This comment is the same as Comment 126-Socio-Economics, 13.

31 The fact that the NTPC proposal would involve use of the land at Green Point for project purposes to the exclusion of other possible uses is discussed in the section on Port-Land Use in Chapter 3.

### SOCIO-ECONOMIC

32 The hypothetical nature of oil spill risk scenarios, the significance of time of year of occurrence of a spill, the many variables affecting distribution of spilled oil, and the lack of such data as visitor use for county and private shoreline parks precluded a detailed analysis of the type suggested.

33 Both statements are correct; one pertains to actual economic benefits which would occur, while the other identifies some people's perceptions of those benefits within the context in which they would occur.

34 Responses to specific comments contained in Appendix A are in a section with that heading near the end of the responses to Comment Letter 126.

### TRANSPORTATION

1 The numbers and weights of anticipated trucks are presented in NTPC's application to EFSEC. Potential impacts from road damage are discussed in the sections on Port-Transportation and Utilities and Port-Economic Conditions in Chapter 3 of the FES.

2 The Harstad annual traffic growth rate prediction was based on data from 1965 to 1972. The 1.5% per year growth rate prediction is based on data from 1973 to 1976.

3 All available data was reviewed and analysed in reaching conclusions regarding potential impacts on transportation. The data and the conclusions have been reviewed and appear to be reliable and appropriate.

4 Contractor truck traffic has been considered in the impact analysis.

5 The potential impacts of additional traffic resulting from construction are discussed in Chapter 3. Details about road improvements and traffic control would be regulated by the authorities responsible for the particular highways.

6 BLM did not use the NTPC capacity data in identifying the impacts that are described in Chapter 3. The levels of service presented in the FES refer to peak hour volumes.

7 The sections on Economic Conditions in Chapter 3 have been revised for the FES to include consideration of potential impacts on supplies and costs of materials in those instances that they would be expected to be significant.

8 The need for select fill along the pipeline would vary. The BLM analysis indicates a need for approximately 305,000 cubic yards of fill material at the onshore storage facility site. The amount of select fill which might be required is unknown. Most of the required fill is expected to be obtained on the site.

9 Potential impacts on county roads and county personnel are discussed in the sections on Transportation and Utilities, Economic Conditions and Social Conditions in Chapter 3 of the FES.

10 The concern behind this comment is not clear. The statement which it refers to mentioned the possibility that rail service from Seattle to Port Angeles might be discontinued at some time during the next 20 years. An application has been made for abandonment of the line. The section which contained the statement has been deleted from the FES.

11 The figure referred to does show U.S. Highway 101. The section of the text referred to in the comment has been deleted from the FES.

12 Potential impacts on traffic are discussed in the sections on Transportation and Utilities in Chapter 3. The FES does not include a cost-benefit evaluation of the proposals.

13 The significant impacts of using the Around Puget Sound route segment alternative are described in Chapter 9 of the FES. The potential effects of the loss of the Hood Canal Bridge have been considered in that impact assessment.

14 Potential impacts on Front Street are addressed for two intersections, including the one with highest traffic volume. Additional log truck traffic has been identified as a potential impact; however, no reliable information could be obtained about the numbers of additional truck movement that might occur.

15 The FES has been revised to state that the VOR station would have to be relocated. As indicated in the FES, NTPC would pay relocation costs. The potential hazards to air traffic are discussed in the section on Port-Transportation and Utilities in Chapter 3.

### TOURISM/RECREATION

1 The section on Port-Recreation in Chapter 2 has been revised to discuss tourist and recreational uses of the harbor in greater detail. Potential impacts on economics and on harbor traffic are discussed in the sections on Economic Conditions and Transportation and Utilities in Chapter 3. A separation zone between tankers and other vessels may be required, but it is not anticipated that it would cause a significant adverse impact on small boat movements.

2 Refer to the Response to Comment 126-Land Use, 27. These issues are also discussed to some extent in the sections on Visual Resources, Social Conditions, and Land Use.

3 Both the table and the narrative have been revised in the FES.

4 This information has been included in the FES.

5 This error has been corrected.

6 BLM consulted with several members of the Task Force in an attempt to determine the meaning of these questions. The attempt was unsuccessful.

7 The second boat launch is part of the marina which is mentioned.

## TOURISM/RECREATION

8 These issues are addressed in the revisions of the sections on Port-Recreation in the FES.

9 It is not feasible to estimate the loss of tourist business in quantitative terms. Overall, business gains from construction activity would exceed any loss of tourist business, however, some losses would be experienced by some businesses, depending on type of activity and location of the business. This has been discussed in the revision of the section on Port-Economic Conditions in Chapter 3.

10 These issues have been considered in the revision of the section on Port-Recreation in Chapter 2 of the FES. It is not anticipated that the proposed project would have significant impacts on the study area or visitors to the visitor center.

11 Refer to the Response to Comment 126-Land Use, 27.

12 These errors have been corrected.

13 The map has been revised to show the Park, including the parkway corridor, and the Wildlife Refuge as recreational areas with appropriate labels.

14 This error has been corrected.

15 The term "main park boundary" in the DES referred to the Heart O The Hills Ranger Station at Lake Dawn. This term has not been used in the FES; instead specific reference has been made to the Ranger Station.

16 Project construction and operation would not directly affect recreational use of Olympic National Park. The potential impacts on air quality and visibility, which could affect visitors to the park, are discussed in the section on Port-Air Quality in Chapter 3.

17 Refer to the Response to Comment 126-Socio-Economics, 2.

18 Potential air quality impacts are discussed in Chapter 3.

19 The discussion of visibility in the section on Port-Air Quality in Chapter 3 has been changed in the FES to include a more thorough discussion of visibility impacts from the Park Headquarters area and viewpoints on Hurricane ridge.

20 Current figures have been included in the FES.

21 Specific trails are identified in the tables.

22 The map has been revised. However, it is not intended to show site specific detail, so city parks are included in the urban category.

23 The section on Port-Recreation in Chapter 2 has been revised to include wilderness beaches. The effects of oil spills are discussed in terms of potential impacts on various categories of resources, not in terms of specific potential spills on specific beaches.

24 Tourist activity in Santa Barbara which has a large expanse of smooth sandy beach fronting the city is considered more likely to be affected by oil pollution than tourist activity associated with Olympic National Park in the vicinity of Port Angeles. A spill would affect tourist activity associated with recreational fishing.

25 Dungeness Spit has been treated more extensively throughout the FES.

26 Potential impacts on right-of-way uses are discussed in the section on Pipeline System Recreation in Chapter 3. Detailed security plans would be developed later, if the proposal is approved.

27 Additional petroleum-based industry is considered unlikely. This issue has been discussed in more detail in the section on Port-Economic Conditions in Chapter 3 of the FES.

28 These concerns have been considered in the revisions of the sections on Social Well-Being and Quality of Life in the FES.

29 The section on Port-Recreation in Chapter 2 of the FES has been revised to address these concerns.

30 The data presented on recreational bottom fishing is considered adequate. Sport fishing and tourism are not industries in the usual sense. The employment related to these activities is part of the industry employment figures shown in the table on Covered Employment in the section on Port-Economic Conditions in Chapter 2.

31 A discussion of potential impacts from oil spills on recreation at Dungeness Spit has been included in the section on Pipeline System-Recreation in Chapter 3 of the FES.

32 Refer to the subsections on Biological Components of Marine Resources which have been completely rewritten for the FES.

33 These potential impacts have been addressed in the sections on Pipeline Recreation and Pipeline-Wildlife in Chapter 3.

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## UTILITIES

1 Refer to the General Response to Comment 126.

2 The comment refers to the section of the DES which discussed Visual Resources. Solid waste disposal is discussed in the sections on Land Use and Social Conditions while potential impacts to groundwater are discussed in the sections on Aquatic Resources. Also refer to the Response to Comment 27-25.

3 The proposed NTPC project would be expected to have very little affect on solid waste production, except in the case of a major oil spill, as discussed in the sections on Land Use and Social Conditions in Chapter 3 of the FES. The potential for development of secondary petroleum-related industries is discussed in the section on Port-Economic Conditions in Chapter 3.

4 The proposed NTPC project is not expected to have any significant effects on waste handling technology.

5 Refer to the Response to Comment 43-2 and to the sections on Aquatic Resources in Chapter 3 concerning hydrostatic testing.

6 Disposal of oil-saturated soil is discussed in the section of Chapter 1 which describes the NTPC proposal. Also refer to the Response to Comment 27-25. Whether or not burning of oily wastes would be permitted would depend upon the locality of the disposal site.

7 The amounts of solid waste anticipated do not appear to be significant in terms of available landfill capacity. No particularly hazardous waste materials have been identified as likely to be produced during construction or operation of the facilities, except in the case of a major oil spill. Oily wastes would be considered hazardous and would require separate disposal. Refer to the Response to Comment 27-25.

8 Potential impacts on the water, sewer, and waste disposal systems are discussed in the sections on Social Conditions in Chapter 3.

9 Ships' pumps would be used to dispose of bilge waste.

10 Refer to the Responses to Comments 2, 3, 6 and 7 in this section (126-Utilities).

11 NTPC has proposed to install an impervious surface below the tanks and holding basins at the onshore storage facility. NTPC has also proposed to dispose of residue at an on-site landfill, so no impacts on existing waste disposal sites are anticipated.

12 The Ediz Hook water main is discussed in the section on Port-Social Conditions in Chapter 3. Domestic water is not intended to be used for fire fighting.

13 The only fresh water requirements for fire protection would be for human consumption. No potable water would be used for ballasting. The anticipated potable water requirements for the proposed facilities are 3,500 gallons per day. BLM is not aware of any provisions for potable water supplies if city service is interrupted.

14 Refer to the Response to Comment 126-Utilities, 5. The NTPC application to EFSEC contains preliminary applications for NPDES permits.

15 Refer to the Response to Comment 126-Utilities, 8.

16 The methods of sanitary sewerage disposal and storm water drainage are described in the section on the NTPC proposal in Chapter 1 of the FES. Estimated quantities would not cause any significant impacts. The source of sanitary sewerage for the holding tank referred to in the comment would be port facility and tanker ship personnel.

## WATER QUALITY

1 The discussion in the text has remained essentially unchanged. Refer to the Response to Comment 51-6 for additional discussion of this issue.

2 With the booster pumps operating, each submarine pipeline would be capable of a maximum throughput of 100,000 barrels per hour. The state of the art leak detection system, which NTPC has indicated that it would use, is capable of detecting losses of 0.5% of throughput within 2 minutes of occurrence of the leak. A 0.5% leak would amount to 500 barrels per hour but would be detected within 2 minutes, or after approximately 16.7 barrels had leaked. Fugro (1978) has estimated that leak detection and shutdown of the submarine system could be accomplished in 2.5 minutes. With a complete pipeline break approximately 4,167 barrels could leak during the 2.5 minutes. After shutdown there would still be oil in the pipeline segments between the break and the booster pumps and the break and the onshore storage facility. Fugro (1978) has estimated that the static head volume in the segments would cause approximately 740 barrels to spill. Seawater would leak into the broken section of the pipeline until the entire inside diameter of the pipeline was filled and the remaining oil trapped in the pipeline. It is estimated that approximately 40 barrels of oil would be spilled during this process of displacement of oil by seawater. According to these estimates, the total amount of oil spilled from a maximum break would be 4,947 barrels.

During inactive conditions, when oil is not being unloaded, the normal static pressure between the booster pump platform and the onshore storage facility would be between 36 psig and 40 psig depending upon the specific gravity of the oil in the line. Any reduction in static pressure, after taking temperature effects into account, would indicate a leak. Preliminary studies indicate that a leak of 0.07% to 0.14% of the pipeline contents (approximately 50 to 100 barrels) could be detected.

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WATER QUALITY

In addition, during operation, leaks would be detected by the continuous monitoring by computer of the quantities indicated by the turbine meters on the booster pump platform and by the automatic tank gauges on the storage tanks. This system would be less accurate than the primary pressure deviation system described in the first paragraph of this response.

3 Refer to the General Response to Comment 126 and to the Response to Comment 126-Oil Spills, 1.

4 The amounts and types of materials contained in runoff from NTPC's proposed facilities are described in Chapter 3. The actual quantities of specific toxic materials that might occur cannot be reliably estimated.

5 Refer to the Response to Comment 27-4.

6 These issues are discussed under Physical Components in the section on Port-Aquatic Resources in Chapter 3.

7 The potential impacts on Siebert Creek are discussed under Biological Components in the section on Port-Aquatic Resources in Chapter 3.

8 The total amount of earth removal has not been determined by NTPC. Grading and excavation would occur on an area of 140 acres. Excavated material would be temporarily stored on the site. Much of it would be used as structural fill material. Any excess would be spread over the surface or moved to a disposal site approved by local authorities.

Based on three preliminary soil borings the soil substratum is medium dense to very dense sand and/or very stiff to hard clay and silt (Shannon and Wilson 1978, Page 32). The nature of deeper materials is discussed in the section on Port, Topography and Geology in Chapter 2. They are generally described as glacially overridden sediments.

9 The entire onshore storage facility would be diked and the runoff processed prior to controlled discharge into the Strait of Juan de Fuca or Siebert Creek. Processed discharges should not have a significant impact on water quality in Siebert Creek.

10 The recharge area has not been positively delineated, but it is believed to be extensive enough that the project would not significantly affect recharge capacity.

11 Water would be discharged initially into the Strait of Juan de Fuca. If and when the second group of tanks were constructed, (Phase II) which would raise the throughput capacity from 709,000 bpd to 933,000 bpd, water from this addition would be discharged into Siebert Creek approximately 1 mile upstream from the mouth. The applicant does not propose to construct 25 tanks.

12 Noise data for significant locations in Clallam County are given in the section on Noise in Chapter 2, under the portion of the chapter dealing with port and onshore storage facilities.

13 Surface water and ground water resources are discussed in the sections on Aquatic Resources throughout the FES.

14 As discussed in this ES, geologic hazards are natural processes which represent potential hazards to a pipeline. Oil pollution of ground water is considered to be a potential impact and is discussed in the section on Aquatic Resources in Chapter 3.

15 The cited table has been deleted from the FES. Potential impacts on water quality and irrigation systems are discussed in the sections on Aquatic Resources and Land Use in Chapter 3.

16 The potential impacts of oil spills on surface and ground water are discussed in the sections on Aquatic Resources in Chapter 3, where it is recognized that there could be impacts on potable water supplies and/or supply sytems. Specific known water supply sources or facilities which could be affected by oilspills are identified in the Map Addendum. Analyses of specific potential impacts of hypothetical oil spills of certain sizes on specific areas are not included in the ES because of the extent of NTPC's proposed project and the fact that a precise pipeline alignment has not yet been determined. Potential impacts from oil spills are discussed on a resource by resource basis in Chapter 3.

17 This information is included in the section on Port-Aquatic Resources in Chapter 3, but only for NTPC's proposed maximum throughput of 933,000 bpd with two berths at Ediz Hook.

18 On the basis of currently available information no problems with salt water intrusion would be expected.

19 An oil spill in the marine environment would not be expected to affect public drinking water supplies because of filtering, weathering and other factors discussed in the section on Port-Aquatic Resources in Chapter 3.

20 NTPC has changed its proposal for running the pipelines from the shoreline to the storage facility. With the current proposal, which is described in Chapter 1, these impacts would not be expected.

21 Recovered oil would be transfered back to a storage tank.

22 Toxic materials in sediments are mentioned in the discussion referred to in the comment, in the following paragraph. No information is available on subsurface and near bottom currents; therefore, sediment drift cannot be discussed.

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## WATER QUALITY

23 Both statements are correct. Water tables within 2 to 3 feet of the surface are perched or seasonally high water tables. The regional water tables are much deeper.

24 NTPC would have to purchase the water from whoever'holds the water rights. The current status of adjudication would not necessarily affect in any way the availability of water for purchase.

25 Information provided by NTPC.

26 There should be no significnat impacts on resources in the Dungeness River because of the relatively low withdrawl rate.

27 Water would be withdrawn according to the schedule presented in Chapter 1. Permit requirements for withdrawl and monitoring have not been identified.

28 Alternate available sources of water for hydrostatic testing have not been identified by NTPC or BLM.

29 The FES has been corrected to read 39 years of record (1937-1976).

30 Hydrostatic test water would remain in the tanks and submarine lines for a minimum of 24 hours under test pressure. Water would likely be pumped from the storage tanks soon after testing, but would remain in the submarine lines until displaced by oil during startup.

31 NTPC has not provided specific details on rust inhibitor or bacteriacide.

32 This information has been supplied by NTPC. The source is not known.

33 The water source would be the Dungeness River. Adequate water should be available.

34 Average discharge for a 17-year period was 17 cfs, with a minimum and maximum of 2 cfs and 1640 cfs respectively, the low flows occurred in late summer, averaging 2 to 5 cfs. Winter flows range from 10 to 200 cfs. There should be no significant temperature related or other impacts on fish, plant, or marine life resulting from a 1 cfs discharge. It is not known during what months water would be discharged. The discharge site in Siebert Creek would be approximately 1 mile upstream from the mouth.

35 The source of NTPC's assumptions is not known.

36 Potential impacts resulting from premature release of hydrostatic test water have not been investigated.

37 Information supplied by NTPC as part of its project design.

38 Treated hydrostatic test water could be discharged into the Strait of Juan de Fuca at a faster rate than 1 cfs with no significant impacts because of dispersion and dilution factors.

39 Preventive plans have not been identified by NTPC.

40 Soil with low permeability should prevent oil from entering groundwater supplies in the event of an oil spill.

41 Corrosion inhibitors and bacteriacides have not been identified by NTPC. Backup details for the dilution factor have not been identified.

42 The potential effects of the NTPC proposal on the Port Angeles harbor's water quality rating would be caused by oil spills. Small spills would probably not affect the rating; however, in the event of a large spill, the water quality rating might be lowered for some period of time.

43 As explained in the section on Port-Topography/Geology in Chapter 3, it has been determined that pile-driving could induce slope failure on the southwest side of Ediz Hook.

44 Deposition of particulate hydrocarbons is expected to be minimal and no adverse impacts would be anticipated. Particulates from hydrocarbon vapors form only very slowly and would consist of very fine particles that would tend to travel large distances before being deposited on the ground. By the time they are deposited, their concentrations would be very small. Hence no significant deposition would be expected.

45 The estimated petroleum hydrocarbon input levels for Clallam County are 84 barrels per year for Port Angeles and 120 barrels per year for the area of the county outside of Port Angeles. Refer to the discussions of oil spill risks for the port for estimates of additional inputs with NTPC's project in operation.

46 Effluent from the Crown Zellerbach plant is now piped across Ediz Hook to be dumped into the Strait of Juan de Fuca. Other sewage does flow into Port Angeles harbor.

47 The volume of discharge and the amount of dissolved oil components which it would contain cannot be estimated. However, the quality of the water being discharged would be regulated by a NPDES permit from the Environmental Protection Agency.

48 NTPC has not proposed any measures concerning bilge water dumping by tugs. The current NTPC proposal does not include the use of fuel barges. It would not be expected that bilge dumping actions by tugs would be any different with the project than they are currently without the project.

49 It is anticipated that the impacts from construction on water quality in the harbor would persist for approximately 3 months following the conclusion of construction activities.

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## WATER QUALITY

50 NTPC has not yet indicated which method of laying submarine pipelines would be used. Because detailed information on the composition of bottom sediments was not available, separate impact assessments for the two methods were not prepared. In general, the potential impacts from jetting would be more severe than from other methods. Impacts on water quality would be expected to persist for approximately 3 months following the completion of construction.

51 It is not yet known if the NTPC project would require any marine sediment disposal. If it did, the composition of sediments to be disposed and the disposal site would be regulated by federal permits from the U.S. Army Corps of Engineers.

52 No erosion effects on Ediz Hook are expected. Refer to the General Response to Comment 126 concerning a third submarine pipeline.

53 NTPC has not had detailed analyses of bottom sediments performed. If the NTPC proposal is approved, it would probably be required by the Corps of Engineers and/or the Environmental Protection Agency to have the sediments analyzed for potentially hazardous substances.

54 Considering the depth of burial of the submarine pipelines, the potential temperature differential and the vastness of the sediment and water into which any heat would be dissipated, it is expected that there would be only insignificant, if any, effects on water temperature in the harbor.

55 Water quality monitoring schedules have not been identified or determined nor has the entity that would be responsible for the monitoring.

56 The potential effect that this water requirement would have on future industrial expansion has not been determined.

## WILDLIFE/PLANTLIFE

1 The sections on Biological Components of Marine Resources in Chapters 2 and 3 of the FES have been revised to include more detailed discussions of coastal avifauna. The sections on Terrestrial Wildlife in Chapters 2 and 3 include information based on review of baseline studies carried out by the Washington State Department of Game. At the time of preparation of the FES BLM was not aware of any plan for site specific studies of waterfowl which could be affected by the NTPC proposal.

2 The sections on Terrestrial Wildlife in Chapter 2 have been revised to include Port Angeles harbor and other habitats as areas of special concern.

3 According to the review carried out by BLM, Ediz Hook is not currently a designated wildlife reserve and there is apparently no governmental protection for wildlife at Ediz Hook.

4 NTPC has changed its proposal for running the pipelines up the bluff at Green Point to a design which would have considerably less impact on the bluff than the design proposal included in the DES. Refer to the Response to Comment 62-5 concerning sediment transport and erosion at Dungeness Spit.

5 Refer to the Response to Comment 1 in this section. The Marine Resources maps have been revised for the FES.

6 NTPC has indicated that it would maintain the pipeline right-of-way for the life of the project. The responsibility for oil spill cleanup of areas off the right-of-way cannot be anticipated but would probably be determined on consideration of the land owner and the party or parties responsible for the oil spill.

7 Migratory birds have been considered in the revised sections on Terrestrial Wildlife in Chapters 2 and 3.

8 Potential impacts of noise on wildlife have been included in the FES.

9 These points were considered in the revisions of the sections on Biological Components of Marine Resources. The comment does not identify the riparian habitat and game bird nesting area that would be affected so no revision has been made in response to that remark.

10 These concerns about bald eagles have been incorporated into the revisions of the appropriate sections on Terrestrial Wildlife in Chapters 2 and 3 of the FES.

11 The sections on Marine Resources and Terrestrial Wildlife in Chapters 2 and 3 have been revised to include more intensive discussions of avifauna.

12 Refer to the Response to Comment 114-2 concerning the analysis of Canadian habitats.

13 The sections on Biological Components of Marine Resources and the Marine Resources maps have been substantially revised in the FES.

14 Refer to the Response to Comment 126-Wildlife/Plantlife, 10.

15 Refer to the Response to Comment 126-Wildlife/Plantlife, 8.

16 This information was considered in the revisions of the sections on Terrestrial Wildlife in Chapters 2 and 3.

17 The sections on Marine Resources in Chapters 2 and 3 have been extensively rewritten. However, the large size of the marine area being considered, and the limited amount of precise information about rates of oil weathering under various oceanographic conditions and the effects of weathered products on marine organisms and habitats all combine to make definitive quantified analyses impossible. The conclusions presented, though general and qualified represent professional judgements based on the best available data. More detail on trophic levels and food webs would certainly be useful; however, such studies require years of work and were clearly not possible for this ES.

18 A recent NOAA-MESA report (Everitt et al. 1979) mentions that river otters are often confused with sea otters and that the occurrence of sea otters in Puget Sound has not been verified. Stray gray and humpback whales have been sighted in the Strait and the Sound. The FES has been revised to include the latest information from NOAA-MESA on marine mammals.

## WILDLIFE/PLANTLIFE

19 Both statements are correct. One is a statement about observations of seal and sea lion behavior, the other indicates that they could be affected by an oil spill. Potential impacts could include the effects of oil on haul out areas and possibly destructive impacts from cleanup operations.

20 The eelgrass beds in Port Angeles harbor have been identified in the ES. The NTPC comment about marine mammals avoiding contamination is based on the observation of gray whales avoiding the oil slick in the vicinity of the Santa Barbara blow out.

21 The FES has been revised to include mention of the distribution of gray and humpback whales.

22 Eelgrass beds are expected to regenerate because the walkways and trestles at the berth site would be high enough over the water so that photosynthesis should not be impeded.

23 The comment refers to a discussion of how zooplankton could play a role in exposing benthic organisms to oil pollution. The place of zooplankton as prey in the food web is not the issue in that discussion. Once spilled oil is dispersed currents would carry zooplankton back into the affected area.

24 The discussion of terrestrial vegetation has been reviewed and determined adequate for the purpose of evaluating potential impacts from the NTPC project. The sections on Terrestrial Wildlife in Chapter 3 have been revised to include discussions of non-endangered species, competition from multiple land use pressures, and potential impacts from displacement.

25 The text and tables of the sections on Terrestrial Wildlife in Chapters 2 and 3 have been extensively revised. The discussion of the onshore storage facility site has been expanded in the sections on both vegetation and wildlife.

26 A discussion of the possible impacts of air pollution on vegetation has been included in the section on Port-Terrestrial Vegetation in Chapter 3.

27 There is no contradiction. The first statement referred to pertains to plants; the second pertains to eagles.

28 The section on Port-Terrestrial Vegetation in Chapter 3 has been revised to include this information.

29 The section on Port-Terrestrial Vegetation in Chapter 3 has been revised to include this information.

30 A more detailed list of plant species has not been added to the FES because it was not necessary to the evaluation of potential impacts.

31 Potential project related impacts on sensitive biota and habitats are discussed in the Terrestrial Vegetation sections of Chapter 3. Those discussions have been reviewed and it has been determined that the analysis presents a realistic view of potential impacts.

32 The section on Port-Terrestrial Vegetation in Chapter 2 has been revised.

33 Refer to the Response to Comment 62-6.

34 The clearing of approximately 140 acres would be for NTPC's maximum proposed throughput of 933,000 bpd with 18 tanks at the onshore storage facility.

## GENERAL COMMENTS

1 The section on Interrelationships in Chapter 1 has been revised extensively for the FES. In both the DES and the FES the attempt has been made to make it clear that there are a large number of federal, state and local regulations pertaining to the NTPC proposal. There should be no implication that Title V of PURPA would preclude compliance by NTPC, or any other applicant, with applicable federal, state and local requirements.

2 Refer to the Introduction of the FES for an explanation of the decision concerning treatment of potential impacts on resources in Canada. Pertinent information from the U.S. Department of Energy Draft Report on Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000 (1979) has been incorporated into the FES.

3 The FES has been revised to be consistent with the NTPC proposal as of April 16, 1979. Any additional substantial changes in the proposal which would cause significant impacts not addressed in the FES would require a supplement to the FES.

4 The comment mistakenly asserts that the DES states that certain project components and environmental protection measures would be developed after " . . . all permits have been issued." These developments would take place after the FES is complete (as stated in Chapter 1 of the DES and the FES), and generally before permits are issued. Conditions for some permits would probably be related to those design decisions made at later stages of project development. The FES is one component of a decision making process. It is not the last step in that process, nor does it constrain the actions of other federal, state and local agencies.

5 As explained in the Introduction to the FES, the decision not to evaluate potential impacts to Canadian resources in detail is based on Executive Order 12114.

6 The sections on Social Conditions have been completely rewritten for the FES.

7 Refer to the Introduction to the FES concerning the opportunities that are being made available for public review and comment on this FES.

8 The sections on Social Conditions have been completely rewritten for the FES and these statements have been eliminated.

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## MAP ADDENDUM

### General Response

All comments on the Map Addendum have been reviewed. New maps have been added and numerous revisions have been made in response to these and other comments. A number of specific suggestions for changes contained in the section of Comment Letter 126 were not made for the reasons explained below. The small scale General Route Maps showing the 9-state area are designed to be general maps only. Detailed information is provided elsewhere on larger scale maps and in the narrative volumes. Some specific comments seem to be based on the assumption that the Map Addendum is intended to stand alone as an impact evaluation document. This is not the case. The Map Addendum is designed to be used with the narrative volumes. The Alignment Sheets can be used to identify the locations and types of potential impacts, but the reader must refer to the narrative for descriptions and evaluations of those impacts.

1 Isopleths for short-term and annual average concentrations are obtained using the TEM and TCM models, respectively. These are standard EPA recommended models. All models have many simplifying assumptions. There is no one model that simulates natural conditions perfectly. TEM and TCM do not simulate terrain effects; however, they do include inversion heights. In order to determine effects of terrain, VALLEY was used. All results obtained by BLM's consultants were included in the impact analysis.

With respect to the annual average concentrations, it must be pointed out that all $SO_2$ monitoring done in Port Angeles by the Olympic Air Pollution Control Authority prior to December 1, 1977 has been voided. There is therefore no sufficient data base to compare measured concentrations with modeling results. Furthermore, on an annual basis $SO_2$ emissions from NTPC would be only about 14 percent of existing emissions for Port Angeles. The change in concentrations as a result of the NTPC project would therefore not be very large.

## MITIGATION MEASURES

Chapter 4 has been completely revised in the FES. None of the suggestions in this section of Comment 126 have been specifically incorporated into Chapter 4. BLM procedures for handling mitigation measures in this environmental statement are explained in the introduction to Chapter 4.

## APPENDIX A

1 Chapter 1 of the FES has been revised to include the names of the member companies of NTPC.

2 Pertinent information from the Draft Report by the Department of Energy (1979) has been incorporated into the FES.

2 The key issue as far as the NTPC proposal is concerned is not the projected shortfall, but whether crude oil transported by the NTPC system would be competitive at its design capacity. If so, it could replace supplies of crude oil being delivered by more costly delivery systems. The FES contains a market area analysis in the section on Economic Conditions in Chapter 3.

3 Refer to the General Response to Comment 126.

4 Additional information has not been supplied by NTPC. However, NTPC has indicated that it would consult with local fire protection officials during the development of fire protection systems.

5 Refer to the preceeding Response.

6 The NTPC work force estimates were reviewed and revised for the discussion in the sections on Economic Conditions in Chapter 3 of the FES.

7 Chapter 1 of the FES includes NTPC's proposed permanent personnel requirements. Ship board personnel and other induced population increases are discussed in the section on Economic Conditions in Chapter 3.

8 The figures have been reviewed and revised for use in the FES. Refer to the section on Economic Conditions in Chapter 3.

9 Personnel requirements for fire protection are included in total personnel figures. NTPC personnel would operate the equipment. Possible joint use of the equipment would be determined by agreement between NTPC and local fire protection authorities.

10 The legal requirements pertaining to low-sulfur fuel are discussed in Chapter 1 of the FES.

11 Material in the sections on Social Conditions in the FES addresses housing in some detail and provides a discussion and analysis of housing availability and anticipated demands on housing.

12 There is no contradiction. In fact, the Canadian decision to curtail exports to the US is one factor which supports the conclusion that Canada would not need a west coast oil port. The consideration of the need for a Canadian west coast oil port was not concerned with the projected crude oil supply deficit in parts of the United States.

13 Refer to the Responses to Comments 126-Water Quality, 18-20.

14 Note that the comment refers to the section on Land Use in Chapter 2 which is the description of the existing environment, while potential impacts are discussed in Chapter 3. Land use plans were reviewed, and apparent incompatabilities between land use goals or plans and proposed facilities or actions were discussed in the FES.

15 The sections on Transportation and Utilities in Chapters 2 and 3 have been reviewed in light of this comment, and it has been decided that the discussions are adequate for the purposes of identifying potential impacts of the NTPC proposal.

16 The relevant dates have been provided in the FES.

17 The FES has been revised to include a discussion of the Washington State Emergency Powers Act.

18 Potential impacts cannot be assessed with any reliability at this time because BPA is currently in the process of revising their allocation procedures and because there is pending federal legislation that would affect regional power allocations and rates. Also refer to the responses to comments in the Energy section of Comment Letter 126.

19 The importance of tourism and the retired population has been more fully discussed in the section on Port-Economic Conditions in Chapter 3 of the FES. The potential impacts of the NTPC proposal on tourism and the local population are discussed in the section on Port-Economic Conditions in Chapter 3. The section on Port-Recreation in Chapter 3 identifies recreational losses which may occur as a result of the proposed port facility. A description of the area's recreational values and a map of the Ediz Hook area have been included in the section on Port-Recreation in Chapter 2 of the FES.

20 A map has been included in the section on Port-Recreation in Chapter 2 of the FES.

21 Refer to the Responses to Comments 126-Harbor Management, 5, 8, 10, and 14.

22 Population data appearing in the DES has been revised. In the sections on Social Conditions in the FES it is based on information published in Washington State and County Population Forecasts by Age and Sex, 1978.

23 Population distribution data, by age group, has been provided in the FES. Population distribution by sex, and by ethnicity were not provided since these data would not be affected by implementation of the proposed action. Population projections are included in the sections on Social Conditions in the Future Environment portion of Chapter 2.

24 Employment information has been revised for the FES.

25 Refer to the revised text of the section on Port-Economic Conditions in Chapter 3 for a discussion of hiring conditions. Either the local state employment service or local offices established by NTPC or its contractors would provide employment services for local workers. Availability of skills would be determined from applications submitted.

26 The section on Port-Economic Conditions in Chapter 2 has been revised to include information on Port Angeles and Clallam County fiscal conditions. Additional fiscal information is not considered necessary for a description of existing conditions.

27 A revised discussion of housing appears in the FES. Utilizing 1977 data generated by a Clallam County housing survey, the discussion includes material on total numbers of houses, year-round dwellings, occupied units, vacant units, and vacancy rates for Clallam County, Port Angeles, Sequim, and the unincorporated area.

Additional items mentioned in the comment were not considered since they were not relevant to the assessment of impacts.

Housing vacancy rate data are included in the FES. These data indicate that the strain on housing caused by the expected population surge would not be critical. Therefore, it is not likely that "sharply increased housing costs" would be a significant adverse impact.

28 Information on school enrollment figures is contained in the Social Conditions sections of the FES.

29 The sections on Social Conditions in the FES contain data on water supply systems, including the Ediz Hook water line. However, the detailed data suggested by the comment were not considered necessary since implementation of NTPC's proposed project would not create significant adverse impacts on domestic water supply systems.

30 Information on sewerage systems and solid waste disposal in the revised sections on Social Conditions in the FES.

31 Data on fire protection services, included in the DES, have been revised for inclusion in the FES.

32 Police protection service information is provided in the FES. Since implementation of NTPC's proposed project is not expected to have significant adverse impacts on "crime patterns" the suggested data were not included.

33 Information on the ratio of primary care physicians, hospital census rates, and other medical care data has been included in the FES. Alcoholism data were not included since implementation of the proposed project is not expected to create a significant impact on these specific treatment facilities.

34 Because of the relatively brief period during which the construction phase of NTPC's proposed project would affect Port Angeles, existing community services could be strained. However, the analysis of relevant data does not indicate that significant adverse impacts would occur.

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35 An analysis of population data pertaining to probable increases caused by implementation of NTPC's proposed project indicates that no significant adverse impacts would occur on community "amenities". This section of the DES has been deleted from the text of the FES.

36 The baseline information has been revised. The identification of principal industries was based on an examination of personal income by industry (1975 data). Wholesale and retail trade was omitted from consideration as being primarily residentiary, or dependent on the local population, and thus not principal to the local economy.

37 In the infrastructure portion of the Social Conditions sections of the FES, fire protection services are discussed. No significant adverse impacts are anticipated on rural fire protection services from implementation of NTPC's proposed pipeline system project.

38 The analysis of impacts was based on the proposal as specified by the applicant. Secondary impacts, such as industrial expansion or establishment of petrochemical industries, are impossible to quantify. There is no suitable way to analyze these in the ES due to the highly speculative nature of any scenarios. The potential for location of new industry in the Port Angeles area because of the NTPC proposal is discussed in the section on Port-Economic Conditions in Chapter 3 of the FES.

Any company proposing a major new pollution source would have to apply to the U.S. EPA for a permit. It would have to be demonstrated that the new source would not cause a significant deterioration of air quality. Given the constraint caused by the very stringent air quality standards for the nearby Olympic National Park, it is not likely that significant industrial expansion in the Port Angeles area would be allowed.

39 Noise impacts from the use of fuel turbine driven booster pumps at the marine terminal were not analyzed as this is not part of NTPC's proposal.

A quantitative assessment of noise levels would be difficult since detailed information would be needed on the design characteristics of equipment that would be used. The applicant has not specified the design characteristics. Undoubtedly, the use of diesel driven pumps would result in higher noise levels at Ediz Hook than would be the case if electric driven pumps were used. However, it is not possible to quantify the added noise level. Since the proposed port facility would be located more than a mile from the nearest residential area, it is not likely that noise from the diesel driven pumps would be noticeable by residents.

40 The issues raised in this comment have been addressed in the revised sections on Port-Land Use and Port-Economics in Chapter 3 of the FES.

41 The issues raised in this comment have been addressed in the responses to specific comments in the other sections of Comment 126 and in revisions of the FES. Also refer to the Response to Comment 126-Appendix A, 17.

42 Potential economic impacts, including those affecting tourism are discussed in the section on Port-Economic Conditions in Chapter 3 of the FES. Economic values of other recreational resources generally cannot be reliably quantified in dollar values. Potential impacts to the tourist industry during normal project operations are considered to be minor.

43 Material in the economic sections of the FES has been revised to make it more understandable and to provide information necessary to show how estimates were derived.

Comparative examination of population growth was considered generally unnecessary since project-related population increases would be temporary. A high growth rate without the project was considered indicative of existing pressures on local services and was taken into account in determining impacts. While separate consideration was given to the Port Angeles and Sequim areas in Clallam County, county data was regarded as a satisfactory basis for the determination of impacts in other areas. The distribution of construction workers within individual counties was assumed to correspond approximately with the distribution of the population within the county. This assumption was based on a review of survey results for fixed site construction projects (Old West Commission, 1976) which found that non-local construction workers were distributed among communities primarily in accordance with the population size of the community and its distance from the work site. Distance was found to be a relatively weak influence in that study, however. For example, a community 50 miles from the work site was found to attract 77 percent as many workers as a community of the same size only 10 miles from the work site. Since work on the pipeline would be continually moving, the relative distances of communities from the work site would be constantly changing. In view of these considerations, it was concluded that within reasonable commuting distances, the distribution of construction workers would depend mainly on population size alone without regard for the distance of a community from a specific work site.

Numerical values necessary to the estimates have been incorporated in the revised text. The method of determining the local work force has been revised, and the section on Pipeline System Economic Conditions in Chapter 3. See the same section for an explanation of the multipliers used. The in-migration of unemployed workers is discussed in the section on Port-Economic Conditions in Chapter 3. Existing unemployment is not considered a significant factor in determining the population increase since incoming workers would represent mainly special skills not locally available. Secondary workers in the incoming population would compete with local workers and thus not significantly affect local conditions. The proportion of indirect non-local workers accompanied by families was assumed to be more similar to that for non-local construction workers than to that for local residents (or the state average) since employment would be likely to be temporary. If that for residents were applied, however, it would have only a minor effect on the population increase estimates.

Regarding the comments on underestimation of the work force, refer to the section on Pipeline System Economic Conditions in Chapter 3. The proposed project differs in many respects from an average construction scenario.

44 Prospects for induced petroleum industry developments are discussed in the revised section on Port-Economic Conditions in Chapter 3 of the FES.

45 Additional explanation of the operational impacts on employment and population has been provided in the section on Port-Economic Conditions in Chapter 3. Some details of the calculations were omitted there. The table below shows how the impacts were calculated. Direct employment includes all workers directly employed and residing in the area. Contract employees (if any) are classified as induced employment. A portion of tanker crews have been treated as residents and part of direct employment.

### CALCULATION OF IMPACTS ON EMPLOYMENT, POPULATION, AND INCOME, OPERATION PHASE, PORT FACILITIES [1]

Direct Employment:

| | No. | Av. Wage | Personal Income |
|---|---|---|---|
| Operating Personnel | 63 | $12,420[2] | $ 782,520 |
| Resident Crew Members | 14 | 18,333[3] | 256,660 |
| | 77 | | $1,038,910 |

| | | Amount |
|---|---|---|
| Consumption (assumed 66% income) | | 685,680 |
| Final demand (80.8% of consumption) | | 554,030 |
| Consumption multiplier (BEA Region 155) | 2.566 | |
| Net multiplier excluding final demand | | X 1.566 |
| Additional regional gross output | | $861,610 |

Procurement:

| | |
|---|---|
| Ship procurement and crew expenditures | $2,600,000 |
| Average gross margin in trade | x 21% |
| Final demand | 546,000 |
| Multiplier for Trade Industry (BEA Region 155) | x 2.969 |
| Additional regional gross output | $1,621,070 |

| | |
|---|---|
| Total regional gross output | $2,482,680 |
| Proportion attributable to Clallam County | x .6472 |
| Gross output to Clallam County | 1,606,790 |
| Earnings ratio | x .224 |
| Induced earnings in Clallam County | $ 359,920 |
| Average annual wage 12 x 1,074 = $12,888 | |
| Induced employment (= earnings/wage) | 28 workers |
| Direct employment | 77 |
| Total employment | 105 workers |
| Average family size | 3.61 |
| Total population increase | 379 persons |
| Personal income from direct employment | $1,038,910 |
| Personal income from induced employment | 359,920 |
| Total personal income | $1,398,830 |

Source: BLM

[1] Derivation of data not otherwise referenced is given in the sections on Economic Conditions in Chapter 3.

[2] Average wage for operating personnel derived from NTPC, 1978.

[3] Average wage for ship crews derived from SOHIO, 1976.

46 Information on income necessary to the determination of impacts has been included in the FES. Such information is not considered necessary to estimate housing demand because it would not accurately reflect the temporary nature of the demand. The discussions of rental impacts and induced development impacts have been revised.

47 References to the sharing of accommodations in the DES have been deleted from the material in the FES. Housing vacancy rate and transient accommodation data, when evaluated against the estimated increase of in-migrants, indicate that the number of units would be adequate to house the estimated number of newcomers. Speculation about the living arrangements of individuals occupying housing units is beyond the scope of the ES.

48 Most of these issues are addressed in the sections on Social Conditions in the FES. An attempt to identify potential residential preference of in-migrants is not included because it would be completely speculative. Potential financial impacts on schools are not addressed because implementation of the NTPC proposal would result in an average increase in school enrollments of only 1.0% over projections of enrollments without the project.

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49 Available data on the ratio of primary care physicians to population, and on hospital census rates indicate the medical care facilities in Clallam County would be adequate to meet normal injury and accident demands during the construction phase of NTPC's proposed project. These data are presented and discussed in detail in the Social Conditions sections of the FES. Speculation on alcoholism rate increases is beyond the scope of the ES.

50 References in the DES to adverse impacts on law enforcement services have been deleted from the text of the FES. At the present time the ratio of law enforcement personnel to population is below national averages. The projected increases in population without NTPC's proposed action will strain police services. And, while this strain would be intensified by implementation of NTPC's proposed project, the strain, by itself, would not be a significant adverse impact.

Comparisons of the Port Angeles area, if the NTPC proposed action is implemented, to rapid growth communities is invalid. County population growth estimates indicate that, if NTPC's proposed project is implemented, the increase would be comparable to the growth of the county in from 1975 to 1976.

51 Fire protection issues have been addressed in considerable detail in the sections on Social Conditions in the FES. NTPC has not proposed to turn equipment over to the community.

52 Materials in the DES referring to demands for counseling have been deleted from the text of the FES.

53 Potential impacts on fire and police protection, medical services, other social services and on social well-being and quality of life were assessed in terms of the demands which the NTPC project would represent over and above the requirements of the existing and projected population of the community without the project.

54 Sales tax revenues estimates have been revised.

55 These suggestions have not been incorporated into Chapter 4, which was substantially revised for the FES. The introduction to Chapter 4 explains BLM procedures for handling mitigation measures in this FES.

56 The issue of the potential development of other petroleum based industries in Port Angeles has been discussed in substantially more detail in the section on Port-Economic Conditions in Chapter 3 of the FES. The statement in the DES that 5 percent of BPA capacity would be required for operation of the pipeline system was an error and has been corrected in the FES. The other concerns raised in this comment have been considered in the revised sections on Transportation and Utilities, Economic Conditions and Social Conditions in the FES.

57 Refer to the previous response.

58 Exchanges with Japan are discussed in the section on Other Alternatives in Chapter 9 of the FES.

59 The FES has been revised to address NTPC's proposal changes. NTPC has indicated that it would probably use the onshore storage facility site for a pipe coating yard if the lay barge method of installing the submarine pipeline is used.

60 Employment required for the Cross Sound construction of the Cross Sound pipeline is discussed in the sections on Economic Conditions in Chapter 3.

**127**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments of the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 127 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**128**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 128 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**131**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 131 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**134**

1 Refer to the Response to Comment 71-1.

**136**

1 The potential impacts that are discussed in Chapter 3 are based on the system as proposed by NTPC. When specific details were lacking, the impact assessment addresses alternative potential impacts.

2 Refer to the Response to Comment 34-16 for a detailed discussion of leak detection systems.

3 NTPC has changed its proposal for running the pipeline from the shore up to the onshore storage facility site. The new proposal, which does not include the massive cut into the bluff is described in the NTPC section of Chapter 1.

4 The presence of the allotment has been noted. Potential impacts from fugitive dust and traffic are discussed in the sections on Air Quality and Transportation and Utilities in Chapter 3.

5 Information on existing crude oil pipelines indicates that no detrimental effects occur from pipeline temperatures with three feet of soil covering.

6 NTPC is committed to segregate and replace topsoils along the entire route. Topsoils do not generally exceed 30 inches in depth. It would not be practical to segregate 60 inches of topsoil when the top of the pipe is only 36 inches below the surface. NTPC's committments are flexible: "In general, the 'A' horizon will be segregated and recovered. The certified soils experts employed by NTPC will confer with local Soil Conservation District or SCS office for advice on appropriate soil depths for recovery as specified above" (NTPC, 1978b, Vol III, pp 5-11 to 5-12).

7 Refer to the Response to Comment L-22-23.

8 Potential impacts were generally evaluated in terms of NTPC's proposed 20-year economic lifetime. It is true that soil productivity would be lost for as many years as the above ground project facilities are in place.

9 The FES has been revised in response to this information.

10 The 20-year economic life was proposed by NTPC as a length of time during which the need for the pipeline might reasonably be expected to exist and was the period for which project economics were calculated. The operational lifetime cannot be specified since it would depend upon maintenance and equipment replacement. The only adverse impacts that might be expected to increase would be those from oil spills. However, appropriate maintenance and replacement of worn equipment should make such a potential increase negligible. With age, use and wear mechanical and communication equipment could wear out, but replacement would probably not constitute a maintenance problem. Mechanically, the pipeline could be used for other materials; however no other uses are anticipated at this time.

**137**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 137 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to comments made in this letter, refer to the numbered Task Force Comments and Responses.

**138**

1 Refer to the Responses to Comments 18-1 and 51-7.

2 PURPA does not speak to the issue of supplying refineries in Puget Sound. The additional design capacity to serve the Puget Sound refineries is discussed in Chapters 1 and 6. Secretary Adams' rule is temporary, pending completion of a Coast Guard study, and mention of it does not belong in this section.

3 The discussion of the Marine Mammals Protection Act has been corrected in Chapter 1 of the FES.

4 If the NTPC proposal is approved and receives a DOI right-of-way permit, the stipulations on that permit would apply only to Federal land crossed by the pipeline. In addition NTPC will be responsible for obtaining other Federal permits and all necessary non-federal permits. The various permitting entities would, presumably, establish specific measures for mitigation and inspection at that time. The permitting agencies would be responsible for monitoring compliance with their permits.

5 This comment was considered in the revision of the Aquatic Resource sections of Chapter 2 and 3. For the most part site specific detail has not been added; however, water supply sources are identified in the Map Addendum.

6 The concerns identified in this comment have been considered in the revision of the section on Pipeline Aquatic Resources in Chapter 3 and in the revision of the Around Puget Sound Route Segment Alternative in Chapter 9. The fish identified in this comment do not occur in the crossing area but are found several miles downstream.

7 The sections on Biological Components of Marine Resources have been completely rewritten. The table on Effects of Oil on Marine Habitats has been revised and the table of Effects of Oil on Marine Communities has been deleted.

8 NTPC has substantially changed its proposal for bunkering tankers, as reflected in Chapter 1 of the FES. Anticipated fuel barge and tanker traffic to the proposed port facility is discussed in the section on Transportation and Utilities in Chapter 3.

9 The party responsible for the spill would be liable for clean up costs. The probable size of a pipeline spill is much smaller than what would be involved in the loss of a tanker, so the costs and problems would not be expected to be so severe. There are no industry funds similar to TOVALOP and CRISTAL for pipeline transportation systems. The text of the section on Port-Economic Conditions in Chapter 3 has been expanded to include additional discussion of two of the laws pertaining to assignment of liability for an oil spill: 1) the Water Quality Improvement Act of 1970 and 2) the Trans-Alaska Pipeline Authorization Act.

10 The section on Topography/Geology has been revised to clarify potential topographic impacts. Since the final location of the pipeline in the 2-mile corridor has not been determined, site specific mitigation measures to reduce impacts cannot be established at present.

11 Refer to the General Response to Comment 120, which addresses these issues. Refer to the Response to Comment 34-7 concerning right-of-way width.

12 Since the final location of the pipeline within the 2-mile corridor has not been determined, a site specific analysis of potential impacts cannot be made. If the NTPC proposal is approved, more specific geotechnical studies would be conducted and remedial measures would be performed to substantially reduce the potential dangers to the pipeline.

13 Refer to the Response to Comment 34-16 for a discussion of leak detection systems. NTPC's draft Contingency Plan is discussed in Chapter 1 of the FES. Detailed answers to the other questions in this comment are not available at this time.

14 Refer to the Response to Comment 34-35 concerning mitigation measures.

15 The erosion control measures which NTPC has committed itself to are discussed in greater detail in the FES. Tables which summarize potential impacts to soils have been added to the Soils sections of Chapter 3. Definitions of qualitative ratings of soil erosion losses are given in the Glossary. The amount of soil erosion mentioned would be about 0.01 millimeter of surface thickness displaced and only a small portion would remain in suspension long enough to reach streams.

16 The statement about a 5% increase was incorrect. The sentence has been deleted from the FES. Regional energy demand is discussed in the section on Transportation and Utilities in Chapter 3.

17 The pipeline oil spill risk analysis, described in Chapter 3 of the FES, is based on historical pipeline spill frequencies and magnitude. Hypothetical spills at specific locations along the pipeline have not been analyzed in the ES.

18 The Cross-Puget Sound route, now the proposed route of NTPC, is discussed in Chapters 1 through 7 of the FES. The route was proposed as potentially less environmentally damaging than the route around the Sound. The cost basis for the determination of rates cannot be determined prior to hearings on a rate application according to the Federal Energy Regulatory Commission (L. Slavin, telephone interview, 6/28/79). Tariffs on a marginal cost basis have not been estimated. Tariff for Puget Sound refineries would be lower for a cross-Sound route than for a route around the Sound. Separate studies by the U.S. Department of Energy will evaluate financial feasibility of the proposed projects and will contain revised tariff estimates.

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**CONT**

19 The discussion of marine oil spill risks and potential oil spill impacts for alternate port sites has been revised in Chapter 9 of the FES. The statement concerning vessel traffic congestion at Burrows Bay referred to the Bay itself. However, no significant traffic congestion would be expected in the Sound since the increase in traffic would be less than 10 percent.

20 The FES has been revised to include revised and expanded descriptions and evaluations of the impacts of the Cross-Puget Sound proposal in Chapters 1 through 7. NTPC has not proposed to construct a double-walled submarine pipeline. Potential oil leaks from the submarine pipelines are discussed in Chapter 3 under Oil Spill Risk Analysis. Also, refer to the Response to Comment 126-Water Quality, 2.

21 The prospects for additional petroleum-related industry are discussed in the section on Port-Economic Conditions in Chapter 3 of the FES.

**139**

1 The portion of section 1.4 which is referred to in the comment has been deleted from the FES. The need for identification, protection and mitigation of cultural resources is mentioned in Chapter 4.

2 These changes have been made.

3 Fort Buford has been added to the Historic Resource table in the Cultural Resources section of Chapter 2, as a precaution to ensure recognition of the many resources in the area. According to the non-specific pipeline alignment currently proposed by NTPC, both Fort Union and Fort Buford lie close to, but outside of, the 2-mile wide study corridor. The lack of clarity on Alignment Sheet 19 is an unfortunate result of the requirements of scale and space in providing map coverage for the NTPC proposal. The larger scale maps used for environmental analysis indicate clearly that the corridor, as currently proposed, would not affect the cultural resource properties.

4 This has been done to a limited extent only; and not systematically. A comprehensive update of the data has not been completed. Therefore, except where specifically noted, the cultural resource information in the FES does not include inventory work done since compilation of data for the DES.

5 Chapter 4 of the FES has been substantially revised, and includes no references to cultural resource protection which could be provided by state laws.

**141**

1 The sections on Marine Resources - Biological Components in Chapter 2 and 3 have been completely rewritten for the FES. The pertinent issues in the General and Specific Comments of Letter 141 were considered during that rewrite, but itemized responses to those comments have not been prepared.

2 Pink salmon have been discussed specifically to reflect this concern.

3 These concerns have been addressed in the revision of the section on Pipeline Aquatic Resources in Chapter 3.

4 Oil contaminated water would be replaced by clean water quite rapidly in most streams. Oil residues could adhere to bank and bottom surfaces and reduce the use of those areas for several months or longer.

5 The details of ships' water intake systems were not available, however, intake would be screened. Design details for hydrostatic testing have not been identified by NTPC. The potential for transmission of fish diseases would have to be taken into account during the NPDES permitting process. Hydrostatic test impacts are addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

6 Refer to the General Response to Comment Letter 120 concerning NTPC project design details.

7 Only methods and/or procedures proposed by NTPC have been addressed. Also refer to the Responses to Comments 18-1 and 51-7.

8 Blasting techniques have not been identified by NTPC. Timing of blasting activities would be determined according to the construction schedule described in Chapter 1. It is likely that mortalities to aquatic life would occur as a result of blasting, but identification of species potentially affected and quantification is not possible.

9 Impacts to fisheries resources resulting from disturbances to aquifers is not expected to be significant.

10 Refer to the first part of the Response to Comment 107-1 concerning revegetation.

11 Only the larger, more productive salmon streams have been specifically identified, although it is recognized that additional salmon bearing streams and streams tributary to salmon bearing streams would also be crossed. Refer to the Response to Comment 76-10 concerning the definition of major and minor streams.

12 This concern has been incorporated into the revisions of the section on Aquatic Resources in Chapter 2 and of the Map Addendum.

13 Refer to the Response to Comment 113C-6.

14 Refer to the Response to Comment 141-1.

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**CONT**

15 Refer to the first 2 paragraphs of the General Response to Comment 126, concerning the specific comments about NTPC's proposal. Concerning other issues, a barrel equals 42 gallons and one dead weight ton equals approximately 6.5 barrels. The proposed pipeline from Ediz Hook to Green Point would not cross any areas which are generally used for vessel anchorages. Refer to the Response to Comment 120-52 concerning the environmental inspector issue, and to the Response to Comment 93-4 concerning the list of mitigation measures that appeared in Chapter 1 of the DES.

16 NTPC's proposal for running the pipelines from the shoreline to the onshore storage facility site has been changed. Refer to Chapter 1 for the current proposal. Refer to the Response to Comment 62-5 concerning potential affects on long shore drift and Dungeness Spit.

17 Fishery Resources in Siebert Creek are identified in Chapter 2. Potential impacts are identified in the section on Port Aquatic Resources in Chapter 3.

18 Clam digging was given more emphasis in the FES. The recreational activities at Neah Bay and in North Puget Sound have been noted but not incorporated into the FES.

19 The footnote referred to, in the table on Fishery Production has been revised. The table on Non-agriculture Wage and Salary Employment presents data on employment by industry. Employment in commercial fishing is not reported in a separate category. It is reported in the combined category, Agriculture, Forestry and Fishing, which is not included in the table referred to.

20 Refer to the Response to Comment 141-11.

21 All of these concerns have been considered and most have been incorporated into the revision of the sections on Aquatic Resources - Biological Components in Chapter 2. Also refer to the Response to Comment 141-11.

22 The information concerning Indian Fisheries has been included in the section of Chapter 9 on the Around Puget Sound Route Segment Alternative. Enhancement projects have not been included. Specific locations for terminal fisheries have not been identified. However, for purposes of identifying potential impacts on those fisheries the discussion of impacts on river fisheries in the section on Pipeline System Aquatic Resources in Chapter 3 is appropriate, even though the actual fishing operations normally occur in estuarine or marine waters.

23 Chapter 2 has been revised in response to NTPC's change in proposed route. This specific item of information has been deleted in the revisions for the section of Chapter 9 on the Around Puget Sound Route Segment Alternative.

24 Freshwater life history phases were not included for the Columbia River since there are no spawning areas immediately below the proposed pipeline crossing. Life history information for fish in the Yakima River has been included in the revision of the section on Pipeline System Aquatic Resources in Chapter 2.

25 This information has been included in the revision of the discussion of the Around Puget Sound Route Segment Alternative in Chapter 9 of the FES.

26 This comment has been incorporated into the revision of the Future Environment section on Pipeline System Aquatic Resources in Chapter 2.

The information in the comment has been noted. The section of the DES referred to, on the Future Environment, has been deleted from the FES.

27 Ships' water intakes are generally screened.

28 Refer to the Response to Comment 141-16.

29 Only minor amounts of soil would reach Siebert Creek. Refer to the Response to Comment 126 - Geology, 13. The erosion rates would be approximately the same.

30 It is expected that the temperature of the discharge water would be within a few degrees of water in Siebert Creek. Temperature differences should not significantly impact Fisheries Resources.

31 Complete physical and chemical analyses of sediments between the berth and Green Point are not available. A joint Corps of Engineers and EPA permit would probably be required. Whether in-water disposal would meet EPA criteria is not known at this time. Potential impacts on out-migration would not be critical since it occurs from January through July for Siebert Creek.

32 Sea leg risk is addressed in the SOHIO EIS (U.S. Department of the Interior 1977b) Therefore, it was decided to begin the NTPC risk analyses at Cape Flattery. Estimated times are included in the revised oil spill trajectories in the FES. Conditions used to model the trajectories may be found in Stewart (1978) and the report on trajectory analyses by the Oceanographic Institute of Washington (1979).

33 The table on Effects of Oil on Marine Habitats lists the expected initial impacts and expected recovery rates of various marine substraits or habitats. The table includes "low energy" shorelines such as mud, mixed-fine, eelgrass beds, and saltmarsh. Specific recovery times cannot be given since the quantity and type of oil, tidal heights, flushing times, and other factors all affect recovery. These shoreline classifications are those proposed by the Washington State Department of Ecology. The 87,000 bbl spill was used as an example. Dissolution of carcinogens, mutagens, and other toxic substances and the length of time for suppression of D.O. would depend upon the oceanographic and meteorological conditions. Concentrations in seawater would depend upon turbulence at the time of the spill and the rapidity of cleanup operations.

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**CONT.**

34 Refer to the Response to Comment 126-Oil Spill, 1 for information about a study of anchor dragging. The potential impacts of the NTPC proposal on Port Angeles harbor are discussed in various sections of Chapter 3 of the FES.

35 The section on Port-Economic Conditions in Chapter 3 has been revised. A large spill (over 1,000 barrels) would generally have minor impacts on salmon harvests. The potential impacts of a spill of over 10,000 barrels would depend on a number of indeterminate factors. Refer to the section on Port-Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 for a discussion of those variables.

36 Total beach clean-up costs would depend on a number of indeterminate factors. Refer to the section on Port-Oil Spill, Fire and Explosion Risk Analyses in Chapter 3. No estimate of open water clean-up costs is available on either a unit or total basis. Such costs also depend on a number of indeterminate factors. Refer to the section on Port-Economic Conditions in Chapter 3 for discussion of liability and compensation.

37 The potential effects of sedimentation and hydrostatic testing on Fishery Resources are addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

38 The number of miles of stream crossings has not been determined.

39 Estimated sediment loads for alternative stream crossing techniques have not been developed. Suspended sediments would generally remain high for several days with heavier particles settling out and gradually moving downstream. Some sediments could remain in the stream indefinately.

40 Refer to the Responses to Comments 141-2 and 141-4. Salmon losses resulting from an oil spill in a steam would probably not be noticed in the ocean fishery because of naturally fluctuating population levels and mixing of stocks from other streams. However, losses could be noticed in the streams. However, losses could be noticed in the stream fishery on which the spill occurred on the subsequent spawning run of the affected year-class. Stream fisheries where losses might be noticed include Indian net fisheries, sport fisheries, and terminal fisheries in estuaries.

41 It has been determined that sufficient detail has been included addressing minor impacts.

42 These comments have been considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

43 Impacts addressed in the section on Pipeline System Aquatic Resources in Chapter 3 generally represent those most likely to occur. Where "worst case" examples are presented, they are identified as such.

44 Depending on fish species occurrence and spawning distribution it could be possible to impact all species within a stream. However, since spawning usually occurs over a considerable distance both upstream and downstream from the crossing area, only a portion of a particular species is likely to be impacted, not the entire population. The greatest impacts from sediments would generally last one year or less in a particular locality. In subsequent years, sediment would move downstream and impact other areas. Impacts would generally decrease downstream because of sediment dispersal.

45 The number of spills that would be expected to occur at a stream crossing in the state of Washington has not been determined. There is a leak rate of 0.0022 leaks per mile per year for pipelines in the United States (Oceanographic Institute of Washington 1978). Assuming about 5 miles of stream crossing pipeline length for the entire project, and a 20-year project life, 0.22 spills would be expected to occur at a stream crossing. This is the equivalent of 1 spill per 91 years for the entire project. The expected leak rate at a specific stream would be a fraction of 0.22, based on length of pipe at that stream compared to the total pipeline length (about 1500 miles).

46 The impacts listed include only those which affect freshwater organisms, not user groups. It is recognized that an oil spill could interfere with commercial fishing as well as sport and Indian fishing.

47 Refer to the Response to Comment 34-28. Additional details about herbicides are not available.

48 Refer to the Response to Comment 113C-6 concerning mitigation measures.

49 Refer to the Response to Comment 71-2.

**142**

1 Conservation, retrofitting west coast refineries and exchanges with Japan have been addressed in the section on Other Alternatives in Chapter 9 of the FES.

**143**

1 Refer to the Response to Comment 138-20. The pipelines would not go through any areas of subfreezing water.

2 The tides within the Strait are the mixed semidiurnal type. Superimposed upon tidal currents and wind generated currents is a seaward residual current or estuarine flow dominated by freshwater from the Fraser River.

**144**

1 The FES considers the NEC and other Title V proposals in much greater detail than was included in the DES. Refer to Chapter 1 for proposal descriptions and to Chapter 8 for the evaluations of the NEC, TMC and KPL proposals. Refer to the Introduction to the FES for an explanation of the opportunities available for public review of and comment on this FES.

2 These issues are discussed in the appropriate parts of the NEC section of Chapter 8. However, the discussion does not give specific numbers except to indicate monetary value of fishing industry along the tanker route. The text generally explains that a large (over 10,000 barrels) spill, fire, or explosion would not be likely statistically, during the 20 year life expectancy of the project. Humpback and Pacific gray whales are noted as being endangered species, and so especially subject to impacts.

3 Refer to sections on Cultural Resources in the NEC section of Chapter 8.

4 These issues are discussed in several parts of the NEC section of Chapter 8. The potential impacts on tourism include noise, dust and crowding of hotels and campgrounds during construction. Tanker traffic could cause delays in docking of ferries or tow ships on occasion. In other areas along the proposed tanker route there would be ample room for tankers and tourist ships. Tourism would be affected by an oil spill, but the impacts are expected to be short term.

5 Construction of the pipeline would probably require temporary suspension of rail services with resulting impacts on both freight and passenger services. These construction impacts would be only short term. The continued operation of the railroad appears to be related to the economics of freight hauling and not to whether or not the pipeline is built.

6 The decisions about future operations of the railroad, freight shipping by mining company and future maintenance of the highway are all outside the scope of this ES. They are all issues which are essentially independent of the potential environmental impacts of the NEC proposal.

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1 The Introduction to the FES explains the decision to publish the FES rather than another DES and outlines the special opportunities which will be available to review and comment on the FES.

2 The statement has been changed in the FES.

3 The Summary of the FES is an entirely new document, based on the FES itself, not on a revision of the Draft Summary. Therefore, while these comments have been reviewed, specific responses to them have not been written.

4 Chapter 1 has been revised to indicate that NTPC proposes to provide a diesel fuel tank at the berthing facility.

5 Oil spill cleanup provisions proposed by NTPC are discussed in Chapter 1 of the FES.

6 The need for additional studies prior to construction, if the NTPC project is approved and implemented, is indicated in Chapter 1 of the FES.

7 Refer to the Response to Comment 126 - Engineering, 7.

8 In the FES, BLM has assumed a one-year delay in the schedule for impact assessment purposes. NTPC has recognized that their proposed schedule has changed but has not established a new one because of the uncertainties of the permitting process.

9 With regard to the errors in Tables 1.4-22 and 1.4-23 of the DES there was a $5 million deficit error in the tanker unloading facilities cost (initial phase). When corrected the total pipeline system cost was correct as shown. NTPC furnished a revised set of cost estimates, dated March 23, 1979, which have replaced the original tables in the FES. The construction cost estimates exclude interest during construction, escalation, cost of line fill, and working capital and debt expenses as pointed out in footnote 1 of the Summary Cost table.

10 Tariff estimates for each of the proposals are discussed in subsections of Chapter 1 of the FES. The tariff estimates from the draft report by the U.S. Department of Energy (1979) were used for those discussions.

11 The list of mitigation measures has been deleted from Chapter 1 of the FES. Those measures proposed by NTPC have been considered to be integral parts of the project proposal. Mitigation is discussed in Chapter 4 of the FES.

12 Information concerning the Foothills (NEC) proposal has been updated in the FES. Refer to Chapter 1 for description of the NEC proposal and to Chapter 8 for an evaluation of potential impacts.

13 The requirement that tribal officials give approval prior to crossing Indian lands is based on interpretations of the treaties which established the various Reservations, not on any specific law pertaining to Indian lands. NTPC has re-applied to the State of Minnesota for a Certificate of Need. Since the decision on the current application was not yet available no mention was included in the FES.

14 The sections on Topography/Geology in Chapter 2 have been revised to give a more complete picture of the seismic risk and seismic-related hazards.

15 This error has been corrected in the FES.

16 NTPC's proposal for running the pipelines from the shoreline to the storage facility site has been greatly changed since publication of the DES. The assessment of potential impacts to the bluff at Green Point has been revised to be consistent with NTPC's current proposal.

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**CONT.**

17 These considerations have been reviewed and considered in the evaluation of impacts which is presented in Chapter 3.

18 The sections on Social Conditions in Chapter 2 have been completely revised for the FES. Schools are discussed. In the FES, Economic Conditions are discussed in separate sections.

19 The FES has been revised to indicate that no significant impacts are expected on schools near the pipeline route during construction, operation, or abandonment.

20 Available facilities have been evaluated in terms of the anticipated medical needs of the construction population. No potential significant adverse impacts on existing facilities were identified.

21 The comment refers to material in Chapter 2 which is descriptive. The evaluation of adequacy is in Chapter 3.

22 This has been included in the FES.

23 Refer to the Response to Comment 145-13 concerning Minnesota. NTPC's proposed route no longer goes across the Flathead Reservation so the statement referred to has been deleted.

24 Noise from trucks operating on streets would be intermittent. Although noise would be noticeable for brief periods of time, average daily noise levels would not be expected to change significantly.

25 The section on Pipeline System Topography/Geology in Chapter 2, under Slope Instability, has been revised to give a more updated assessment of impacts.

26 There is no known documentation to support the contention that major earthquake damage has occurred in Port Angeles. Final design criteria would include provisions for earthquake damage as required by the 1976 Uniform Building Code.

27 By using historical data, exposures to various levels of seismic activity are accounted for in computing the probabilities of an oil spill at a tank farm. Earthquake potential has been assessed in the section on Port-Topography/Geology in Chapter 3. Also refer to the Response to Comment 145-26.

28 This section has been revised; however, because of Executive Order 12114 (see Introduction to the FES), this section does not address potential impacts to foreign waters or countries.

29 Projections of this type are beyond the scope of the ES due to the fact that unverifiable data would have to be used. Construction of the Alaska Pipeline is not comparable to NTPC.

30 The text of the section on Port-Economic Conditions in Chapter 3 has been revised. While transient lodging space would be in short supply during the construction period, it is not considered likely that tourism will be adversely affected subsequently. Tourism may be increased in the immediate post-construction period by an accumulation of postponed demand. The possibility of over-capitalization by local businesses in response to a recognized short-term demand is considered remote. Potential effects on the labor market and wage levels are discussed in the revised section on Port-Economic Conditions in Chapter 3.

31 The sections on Social Conditions in Chapters 2 and 3 have been extensively rewritten in the FES. Potential impacts on medical facilities have been re-evaluated, but the assessment of potential impacts at Port Angeles has remained essentially the same.

32 References to social disruption and to the deterioration of social cohesion have been deleted from the text of the FES, since it is not anticipated that NTPC's proposed project would cause significant impacts of those kinds.

33 References to an "increased demand" for counseling services have been deleted from the text of the FES. During the construction phase of NTPC's proposed project an increase in the use of available services might occur. However, this would be of relatively brief duration and is not regarded as a significant adverse impact.

Only minor impacts on community services would be likely during the post-construction period. Potential impacts on tourism, fishing and boating are discussed in the revised section on Port-Economic Conditions in Chapter 3 of the FES.

34 Mention of "impacts to human health from eating contaminated seafood" has been deleted from material in the FES because such impacts would not adversely affect available medical facilities or services.

35 Scour depths were provided to BLM by NTPC. Potential impacts resulting from the burial depth required have been identified and analysed in the section on Pipeline System Aquatic Resources in Chapter 3.

36 The section on Pipeline System Topography/Geology, under Mineral Resources, in Chapter 3 has been slightly reworded to address the concerns pertaining to borrow material.

37 The section on Pipeline System Soils in Chapter 3 has been amended to reflect this comment.

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**CONT**

38 NTPC has changed its proposed route, and it no longer crosses grizzly bear habitat.

39 Herbicides would not directly affect other land uses (i.e. agricultural or grassland) because they are allowable land uses and there would be no need to spray such areas. Herbicides could affect other land uses indirectly by the residual amount of herbicide draining into streams and irrigation ditches. The degree of impact is unknown, although it should be insignificant considering the limited herbicide use and acreage it would be applied on.

40 Discussions about displacement and reduction of species are included in the revised sections on Terrestrial Wildlife in Chapters 2 and 3 of the FES.

41 Acreage figures have been revised in the FES.

42 These "population pressures" will be of short duration and while temporarily disturbing would have no significant adverse impacts.

43 References to individuals and/or organizations contacted are in Chapter 10 of the FES. Supporting documentation is on file in the BLM Northern Tier Archives.

44 Increased demands on Government services (e.g., planning) are discussed in the Social Conditions sections of the FES. No significant adverse impacts are anticipated.

45 Refer to the Response to Comment 145-13. The decision by the Tribal Council of the Confederated Salish and Kootenai Tribes no longer constitutes a constraint to the NTPC proposal since NTPC now proposes a route which does not cross the Reservation.

46 The substance of these comments is addressed in the revised text of the section on Port-Economic Conditions in Chapter 3 and in the Response to Comment 145-30.

47 Hospital census rates, and the ratio of primary care physicians to residents are discussed in the FES. That data indicates that there would be adequate facilities and personnel for handling the anticipated demand for medical care during construction of the proposed facilities. The "strains" that may occur would be of brief duration and would not represent a significant adverse impact.

48 With regard to the relatively brief duration of the construction phase of the proposed action, no significant adverse impacts are expected to occur on existing community services.

49 Some tourist-related businesses would probably be adversely affected by construction activity. This is discussed in the revised text of the section on Port-Economic Conditions in Chapter 3 of the FES.

50 References to social disruption have been deleted from the text of the FES. A study of pipeline workers indicated that none of the law enforcement agencies in the communities where non-local pipeline workers lived reported an increase in crime or a sufficient increase in disturbances intensive enough to cause an increased workload or to necessitate an increase in staff (Mountain-West Research, 1979). Specific data for communities was analyzed leading to the conclusion that no significant adverse impacts would occur; data on which this conclusion was based are on file in the BLM Northern Tier Archives.

51 It is difficult to anticipate the long-term social impacts of major, short-term projects such as the ones discussed in this ES. This document cannot reasonably speculate on possible impacts such as altered demographic mix, rapid social change or cost of living change. The impacts that can be readily identified are discussed in Chapter 3 and 8.

52 It is beyond the scope of this statement to discuss or identify potential impacts to a number of social services in the individual communities along the proposed pipeline routes. The applicants would coordinate needed services with the communities if and when a project is approved.

53 Reference to additional manpower requirements has been incorporated into the text. The effects of oil spills is considered to be general and of equal significance to all members of the population.

54 The description of the Foothills (NEC) project has been completely revised and substantially expanded in the FES. The project is described in Chapter 1. The environmental analysis of the project is presented in Chapter 8. Refer to the Introduction for a discussion of applications to DOI under Title V and the procedures with which they are being reviewed.

55 The NEC proposal is discussed in Chapters 1 and 8 of the FES. The alternative mentioned in this comment is not discussed in the FES since it differs from the NEC proposal only in pipeline route alignments in Canada, which have been determined to be beyond the scope of the FES.

56 Appropriate changes were made in Chapters 1 and 8 in the FES.

57 Appropriate changes were made in Chapters 1 and 8 in the FES.

**147**

General Response: This comment letter is from the same person who submitted Comment Letter 53. Letter 147 raises many of the same questions that were raised in Letter 53. The responses below address only those points raised for the first time in Letter 147. See also the responses to Comment Letter 53.

1 The Cross-Puget Sound route proposal is discussed and evaluated in Chapters 1 through 7 of the FES, with substantially greater detail than was available in the DES. The Introduction in the FES explains the opportunities for public review and comment on this FES.

**147**
**CONT.**

2 Chapter 1 describes the NTPC proposal for design, construction and operation of the submarine pipelines. Historical data concerning other submarine pipelines was considered in development of the oil spill risk analysis which is discussed in Chapter 3 of the FES. Marine resources and potential impacts on them are also discussed in the appropriate section of the FES.

3 The Cross Sound route is now part of NTPC's proposed route and has been mapped as a Zone 3 Seismic Risk area. The determination that seismic activity is not related to known surface faults was based on studies by USGS, the Washington Department of Natural Resources, the University of Washington and private consulting geologists. It has not been stated that seismic activity would not cause disturbance to the pipeline, rather that an earthquake that exceeded design criteria would be an improbable event, although not impossible.

4 Yes, the pipeline would be buried. The impacts are discussed in Chapter 3, and potential mitigation measures in Chapter 4 of the FES.

5 It would be within one mile of both the Skagit WRA and Fort Ebbey State Park. Many parks are in the vicinity. The Marine Resource Maps indicate locations of parks in the Puget Sound area.

6 The marine mammal and waterfowl maps have all been completely revised.

7 Refer to the section on Pipeline System Oil Spill Risk Analysis in Chapter 3. Also, refer to the Response to Comment 126-Water Quality, 2.

**148**

1 Federal and non-federal permitting agencies and individual landowners who establish easements with NTPC would be responsible for determining the composition of plant species for revegetation of areas under their jurisdiction or ownership.

2 Since publication of the DES, NTPC has stated that it proposes to double ditch the pipeline trench to segregate and replace topsoil along the entire pipeline route. The FES has been revised to indicate this change in the proposal.

3 The concerns mentioned in this comment are addressed in the section on Pipeline System Aquatic Resources in Chapter 3. Also refer to the Response to Comment 43-2 concerning hydrostatic testing.

4 In areas where no specific erosion studies have been made, the potential erosion is projected from known erosion rates of similar soils, topography, climate, and vegetation.

5 The sections on wildlife in Chapters 2 and 3 has been revised to consider the resources in the Ninemile Valley area.

6 NTPC's proposed pump station locations are listed in Chapter 1, and are shown on the Alignment Sheets in the Map Addendum. The NTPC proposal does not involve the use of construction camps.

7 Electrical power needs and potential impacts on local suppliers and consumers are discussed in the sections on Transportation and Utilities in Chapters 2 and 3.

8 The discussion of need has been revised in the section on Projected Demand and Supply in the Introduction to the FES. The discussion is relatively brief and readers should refer to the report by the Department of Energy (1979) for more detail.

9 Arbitration of potential disputes between NTPC and landowners would depend on the terms of easements and possibly the conditions of non-federal permits. The parties responsible for arbitration have not been identified.

10 Specific requirements for maintenance of fences would be established by NTPC and the fence owner at the time easements are obtained.

11 Refer to the Response to Comment 51-12.

12 Refer to the Response to Comment 34-16.

13 There is a new section in Chapter 3 of the FES which discusses Pipeline System Oil Spill, Fire and Explosion Risk Analyses.

14 Refer to the Response to Comment 64-1.

15 The text of the sections on Economic Conditions in Chapter 3 has been amended to include a summary discussion of the estimated impact of construction and operation of NTPC's proposed project on property values. Since potential buyers may consider property less desirable because of the nuisance factors associated with nearby construction activity, it was generally concluded that land values might become temporarily depressed, or appreciate at a slower rate than comparable land further away from the construction activities. Also refer to the Responses to Comments 120-58 and 120-80.

16 The pipeline could be used for other purposes. However, there is no current proposal by NTPC or any other party to convert the proposed oil pipeline to other purposes.

17 Siegel Creek does not support significant fisheries resources or highly sensitive or valuable downstream water uses and therefore has not been identified specifically. The general impacts discussed in the section on Pipeline System Aquatic Resources in Chapter 3 would apply to Siegel Creek.

18 These potential impacts are discussed in the section on Pipeline System Land Use in Chapter 3.

19 The 90-foot construction right-of-way is the width proposed by NTPC. Refer also to the Response to Comment 34-7.

149

1 The current status of the ES being prepared by the Department of Commerce on the Evans Statement is discussed in Chapter 6 of this FES. A discussion of the legal status of the Evans Statement is not within the scope of this FES. Mention of the statement is included only within the context that it has affected the NTPC proposal.

**150**

1 The Cross-Puget Sound route proposal is discussed and evaluated in Chapters 1 through 7 of the FES, with substantially greater detail than was available in the DES. Refer to the Introduction to the FES for an explanation of opportunities for public comment on this FES.

**151**

1 There is to our knowledge no documentation that would support the contention that this kind of project may have an adverse impact on vegetation. The main concern with respect to hydrocarbons is that they may lead to formation of ozone. However, photochemical modeling that was performed indicated little change in ozone concentrations would result from the proposed project, and highest concentrations would be well within the federal standard designed to protect human health and welfare.

2 This has been addressed in both the DES and the FES. However, the concentrations of the toxic, light molecular crude oil fractions in seawater cannot be given. The seawater solubilities for many are not known, but would be expected to be lower than reported distilled water solubilities (See Malins 1977).

3 Within the marine portion of the Puget Lowlands south of the San Juan Islands there are no positively identified faults. The apparent "faults" represent geologic and/or geophysical anomalies that may represent non-tectonic structures. The frequency of seismic events is not as important in assessing risk as the magnitude of the events. Puget Sound has recorded very few large magnitude (6+ Richter) seismic events. Tidal velocities are not extreme. The following table illustrates the expected current velocities:

| | Maximum Current | |
|---|---|---|
| Location | Average Flood | Average Ebb |
| Discovery Island<br>(7.6 miles to the SSE) | 0.7 knots | 1.0 knots |
| Discovery Island<br>(3.0 miles to the SSE) | 0.9 knots | 2.3 knots |
| Kanem Point<br>(1.3 miles to the SW) | 0.3 knots | 1.0 knots |
| Discovery Bay Entrance -- current is weak with direction variable | | |
| Partridge Point<br>(3.7 miles to the W) | 0.4 knots | 2.1 knots |

SOURCE: U.S. Dept of Commerce 1979. Tidal Current Tables Pacific Coast of North America.

4 These comments were considered during the rewriting of the sections on Biological Components of Marine Resources in Chapter 2 and 3 of the FES.

5 Refer to the Response to Comment 27-25.

6 Localized opposition to NTPC's proposed project is discussed in the subsections on Social Well-Being and Quality of Life in the sections on Social Conditions in Chapters 2 and 3.

**152**

1 The equipment would either drive across the streams or use existing bridges. Specific details about how particular equipment would cross particular streams are not known at the current stage of project design development. Potential impacts are considered in Chapter 3.

2 This issue is discussed in the section on Pipeline System Transportation and Utilities in Chapter 3. The proposed project would require less than 1% of existing regional power generation capacity. Thus it would have minimal impact on Montana's power resources or strip mining.

3 The sections on Social Conditions have been rewritten for the FES. Consideration is given to the effects of the pipeline on social well-being and quality of life indicators in terms of rural residents. Specific communities, however, have not been discussed unless there is an indication that there would be significant adverse impacts.

4 Refer to the Response to Comment 51-10. Potential impacts from hydrostatic testing are discussed in the sections on Aquatic Resources in Chapter 3.

5 The potential impacts of construction equipment oil spills are discussed in the section on Pipeline System Soils in Chapter 3.

6 Refer to the Responses to Comments 120-52 and 138-4.

7 The text and supporting data has been expanded in the Supply and Demand and the Utilization of Alaskan North Slope Production sections of the Introduction to the FES, to provide a more thorough assessment of the national need for Alaskan crude oil. A current update (1979) from the Department of Energy on the status of its useability on the west coast is included in the latter section mentioned above, in the FES.

**152** CONT.

8 Reallocation of the crude oil supplies within the state of Montana has been considered in the section on Other Alternatives in Chapter 9 of the FES.

**154**

1 The Cross Puget Sound route proposal is discussed and evaluated in Chapters 1 through 7 of the FES, with substantially greater detail than was available in the DES. Also refer to the Response to Comment 151-3.

**156**

1 Refer to the Response to Comment 79-1.

**157**

1 The Cross Puget Sound route alternative is discussed and evaluated in Chapters 1 through 7 of the FES, with substantially greater detail than was available in the DES. Refer to the FES for an explanation of opportunities for public comment on this FES.

**158**

1 The issues mentioned have been considered in the revision of the section on Pipeline System Topography/Geology in Chapter 3 of the FES.

2 A review of the published soil survey data for Island County indicates that approximately 0.4 miles of the proposed route is poorly drained. This leaves 15.4 miles that are well drained.

3 Potential contamination of ground water is addressed in the section on Pipeline System Aquatic Resources in Chapter 3. The EPA has identified the Spokane-Rathdrum Prairie Aquifer as a "sole source" water supply. NTPC has proposed a route alignment that would avoid this area.

4 These comments were considered during the rewriting of the sections on Biological Components of Marine Resources in Chapters 2 and 3 of the FES.

5 No trajectories are available since this route was originally considered an alternative. Inferred trajectories have been discussed in the FES, based upon tidal data only. Detailed analyses within the Whidbey Basin have not been accomplished.

6 This issue is discussed in the Wildlife sections of Chapter 2 of the FES.

7 This information is now included in the table of Historic Resources in the section on Pipeline System Cultural Resources in Chapter 2 of the FES.

8 Potential impacts to visual resources are discussed in Chapter 3 of the FES.

9 The Cross Puget Sound route segement is now the proposed route of NTPC. Therefore, discussion of this route segement and evaluation of potential environmental impacts along it have been moved from Chapter 8 of the DES into the various sections of Chapters 1 through 7 of the FES. This comment was considered when revisions were made to implement the charge in the FES.

10 The sections on Port-Recreation in Chapters 2 and 3 of the FES have been revised to include discussion of tourism.

11 Data on housing are included in the table on "Community Resources for Counties Adjacent to Northern Tier Port Facility and Pipeline Route" in the section on Pipeline System Social Conditions in Chapter 2. Potential impacts on housing are discussed in the sections on Social Conditions in Chapter 3.

**159**

1 This comment, while addressed to Chapter 7, is more germane to discussions found in the Introduction to the FES and Chapters 3 and 5. Much of the FES has been revised to reflect information received since the DES was published. Specifically, the analysis in Comment Letter 159 appears to be mistaken in two respects. First, it assumes that power consumed in Washington and Montana would be one-half hydroelectric and therefore, not an energy cost. The NEC proposal assumes no increase in hydro-power generation beyond 1980 and also it does not seem legitimate in any case to treat hydro-power as not being an energy cost. Assuming the other calculations are correct however, the pipeline energy consumption via the southern route would still be over twenty percent greater than the northern route.

Secondly, the analysis shows a very high proportion of energy consumption attributed to tanker movements. The tanker figures are not supported. The DOE energy analysis shows consumption for the northern tier route about equal for tankers as compared with the pipeline. Of course, the DOE analysis omits one-half the fuel consumed on each round trip voyage on the assumption that it is not part of a national energy balance.

2 These comments on the Mid-Continent Pipelines were reviewed, and it was determined that no specific changes in the FES treatment of this alternative system would be made.

1 The FES includes consideration of information submitted by NTPC to EFSEC and to BLM up to April 16, 1979.

2 Second and third order impacts are discussed only if they could be quantified.

3 The inconsistency identified in this comment also exists in the FES. The way information is presented and the way potential impacts are analyzed depends on the nature of the specific resource. Some environmental components can be effectively analyzed in corridor terms, while a reasonable estimate of potential impacts on other resources requires an assumption of a specific centerline.

4 The Pace Company Report referred to is Crude Oil Supply and Demand Outlook for the Northern Tier and Midwest States, published in September, 1978.

5 The narrative route description has been deleted from Chapter 1 of the FES. The Alignment Sheets have been revised to show the proposed route through Adams County.

6 The tables referred to in the comment have been deleted from the FES. Major highway, railroad, river and canal crossings are shown on the Alignment Sheets in the Map Addendum.

7 This information is included in the section of Chapter 1 which presents the NTPC proposal.

8 The text has been revised to eliminate this contradiction.

9 The recommendations were considered in the analyses of potential impacts for the sections on Pipeline System Land Use and Soils in Chapter 3.

10 When no data are shown for certain pollutants, it indicates that they were not measured.

11 The reference to Map Section IV has been deleted from the FES.

12 An asterisk has been added to identify the nonstandard terms and ratings in the FES.

13 The cultural resources tables and the Alignment Sheets have been corrected in the FES.

14 Pipeline mile identifications have been corrected and revised according to the current NTPC proposal.

15 The table has been corrected to indicate that site 45GR72 is located outside of the study corridor. It is approximately 1.4 miles from the proposed centerline.

16 The text has been corrected.

17 In consideration of certain community services, facilities within a 50 mile commuting distance of the proposed pipeline corridor were identified. Though not crossed by NTPC's proposed centerline, portions of Douglas County are within this area of consideration.

18 Reference to the casino development has been deleted from the FES.

19 Unless there are references to specific documents as the sources for data, the analysis relects the professional judgement of the team specialists.

20 NTPC has committed itself to watering the construction site when traversing populated areas. However, in rural areas there could be instances where fugitive dust may affect residences some distance downwind of the construction site during periods of strong winds. The FES includes a statement concerning this potential impact.

21 Noise levels at the Oasis Park would reach about 65 db during the peak construction period, which would last about 2 or 3 days. Noticeable noise impacts would last for a period of about 14 days. Construction would take place during daytime only. The noise impacts would be distracting to visitors and would probably discourage many people from using the site for picnicking, camping, and other recreational activities.

22 The section on Pipeline System Topography/Geology in Chapter 3 has been revised to show that drainages would be blocked or diverted only during the construction phase, which would only amount to a few days or weeks.

23 The data used for estimating onshore pipeline spills in the ES were from the U.S. Coast Guard Pollution Incident Reporting Service (PIRS) file for 1973-1977 (Oceanographic Institute of Washington, 1978). The data used for the estimate in NTPC's application to EFSEC were from the U.S. Interstate Commerce Commission for 1973 and 1974 (NTPC, 1978b, page 2.11-75).

24 The leak detection time is 2 minutes, however an additional 10 minute time is required to completely shut down the pipeline system after the leak has been detected. The 12 minute time refers to shutdown and leak detection time.

25 Refer to the Response to Comment 120-26.

26 The table on Potential Impacts to Wildlife in Areas of Special Concern in the section on Pipeline System Wildlife in Chapter 3 has been revised to include this information.

27 Potential impacts from oil spills in streams and canals are discussed in the sections on Aquatic Resources. Oil spill risk analyses are based on historical data which includes all causes of spills. It would be NTPC's responsibility to provide security from vandalism for its facilities.

**160**
**CONT.**

28 NTPC would have the responsibility of protecting its property and equipment.

29 Refer to the Response to Comment 113C-6.

**161**

1 Information pertaining to the ocean floor surrounding Island County is very limited. Available information was included in the revision of the sections on Topography/Geology in Chapter 2 of the FES.

2 Contamination of ground water is addressed in the section on Pipeline System Aquatic Resources in Chapter 3 of the FES.

3 The sections on Pipeline System Recreation in Chapters 2 and 3 of the FES have been rewritten to include discussion of the Puget Sound amenities and cross sound route change.

4 Refer to the Response to Comment 158-11.

5 The FES has been substantially expanded to provide a comprehensive assessment of three alternative crude oil transportation systems, which along with the NTPC system, have been proposed under the Title V legislation (see the Introduction to the FES). Some attention has also been given to other options as well as alternative route segments within each major alternative. The beneficial and adverse effects on Island County are summarized in the Response to Comment 173-23. The economic, social, environmental and resource factors developed for each alternative and presented in the FES will be considered during the decison-making process.

**162**

1 The information contained in this comment is implied in the table referred to, and has been made more explicit in the revised text preceeding the table.

2 As indicated in the DES, and further clarified in Chapter 1 of the FES, some support facilities would be provided by NTPC, notably a fire boat and fire truck, while electrical power, and other services would be provided by others. The cost estimates for project facilities is inclusive of NTPC support facilities. Costs incurred by others would be considered an impact and where significant is included in Chapter 3.

3 Refer to the first paragraph of the General Response to Comment Letter 120 concerning the design of the NTPC proposal. Refer to the Response to Comment 34-16 for more information about leak detection systems.

4 The section in Chapter 1 describing NTPC's proposal cannot include assurances about NTPC's activities that have not been proposed by NTPC. The sections on Social Conditions in Chapters 2 and 3 have been completely rewritten for the FES. Potential impacts on various ancillary services have been evaluated.

5 The role of EPA in reviewing oil spill contingency plans has been mentioned in the Interrelationships section of Chapter 1 in the FES.

6 Refer to the Response to Comment 93-4.

7 The sections on Social Conditions have been rewritten in the FES. NTPC has re-applied to the State of Minnesota for a Certificate of Need. Since the decision of the current application was not yet available, no mention was included in the FES.

8 The only feasible mitigating measure is to require tankers to burn low-sulfur fuel while in port. NTPC would require tankers to take on fuel with a sulfur content of 0.45 percent for use in port. Enforcement would be the responsibility of the agency giving permission to construct, either the federal Environmental Protection Agency or the Olympic Air Pollution Control Authority. NTPC would have to demonstrate to the satisfaction of EPA, before being granted the permit, that it would be able to meet the air quality standards. To our knowledge, NTPC has not requested a waiver of the PSD Class 1 standards.

9 Page 3-3: The term "immediate vicinity" refers to the 242 acre Green Point construction site.

10 Modeling of particulates from the pulp and lumber processing industries in Port Angeles was performed by the Olympic Air Pollution Control Authority (Drabek, 1977). It was concluded from that study that the violations in the Nonattainment Area could be mainly attributed to local ground-level fugitive sources rather than stack sources. If a proposed project is expected to cause particulate concentrations in a Nonattainment Area to increase by more than 1 ug/m$^3$ for the annual average or more than 5 ug/m$^3$ for the minimum 24-hour average, emission offsets would be required by EPA (Federal Register, Vol. 43, No. 118, June 19, 1978). Contributions from the proposed NTPC project would be within these limits.

11 Estuarine flow has been added to the trajectory model which does change the trajectories. The revised trajectories are presented in the FES. No lightering of tanker outside Ediz Hook is proposed by NTPC.

12 Chapter 4 has been revised in the FES. BLM procedures for handling mitigation measures in this environmental statement are explained in the introduction to Chapter 4.

13 The NTPC has changed its plans and no longer proposes to cut the wedge into the Green Point bluff. Refer to Chapter 1 for a description of NTPC's current proposal.

**162** CONT.

14 The discussion of alternatives has been revised in Chapter 9 of the FES. A description of Title V of the Public Utility Regulatory Policies Act has been presented in the Introduction to the FES. The Northwest Energy (Foothills), Trans Mountain, and Kitimat proposals have been described in Chapter 1 and environmental impacts are discussed in Chapter 8 of the FES.

15 Sea trains across the Arctic and railroad unit trains are discussed in the section on Other Alternatives in Chapter 9 of the FES.

16 Other energy sources, such as coal, solar and synthetic crude, were considered but determined not to be viable alternatives to accomplishing the purpose of the proposed action. However these sources of energy would be factors in determining the crude oil demand in the northern tier states.

17 Increased domestic production, reallocation of domestic supplies and swaps with Japan have been considered in the section on Other Alternatives in Chapter 9 of the FES.

18 Denial of the permit to cross federal lands would prohibit construction of the pipeline system as presently proposed. The purpose of the proposed action under study in this ES has been revised in response to the Title V legislation.

19 The discussion of the Delayed Action Alternative has been revised in Chapter 9 of the FES.

20 Criteria for selecting alternatives have been revised, as discussed in Chapter 9 of the FES.

21 The revised discription of the Foothills (NEC) proposal has been presented in Chapter 1 and the environmental analysis presented in Chapter 8.

22 The discussion of the status of the Trans Mexico pipeline proposal has been revised in the section on the Other Crude Oil Transportation Systems in Chapter 9 of the FES.

23 The discussion of the status of the Trans Guatemala proposal has been revised in Chapter 9 of the FES.

24 The discussions of the Mid-Continent system and Panama Canal Transshipment have been revised in Chapter 9 of the FES.

25 The discussion of the No Action alternative has been revised in Chapter 9 of the FES.

26 Analysis of the NEC (Foothills) proposal has been revised in Chapter 8 of the FES. Cost estimates and tariff estimates are included in the section in Chapter 1 describing the NEC proposal.

27 The Trans Mountain proposal has been described in Chapter 1 and analyzed in Chapter 8 of the FES.

28 The discussion of the SOHIO proposal for a pipeline from Long Beach, California to Midland, Texas has been revised in Chapter 9 of the FES.

29 The discussion of the Trans Mexico pipeline proposal has been revised in Chapter 9 of the FES.

30 The discussion of the Panama Transshipment facility has been revised in Chapter 9 of the FES.

31 The number of pipelines has been changed to five in Chapter 9 of the FES.

32 The discussion of potential impacts of the Mid-Continent Pipeline System has been revised in the section on Other Crude Oil Transportation Systems in Chapter 9 of the FES.

33 A cost benefit assessment as part of the environmental statement is not considered to be required by the referenced legislation.

34 Information concerning local and regional plans likely to interrelate with the proposals are included in the section on Interrelationships in Chapter 1 of the FES. Economic baseline data is reasonably available for the Port Angeles area sufficient to identify likely significant impacts.

35 The information about the pipeline system, including alignment and leak detection, is that presented to BLM by NTPC as the NTPC proposal. BLM has analyzed the potential impacts of that proposal. The decisions on which the proposal is based were NTPC's decisions, not BLM's. Refer to the Response to Comment 34-16 for additional information on leak detection systems.

**163**

1 The sections on Pipeline System Topography/Geology in Chapters 2 and 3 have been revised to reflect this concern. Also refer to the Response to Comment 151-3.

2 Refer to the Response to Comment 158-5.

3 Refer to the Response to Comment 71-2 concerning treatment of NTPC's Cross Sound route proposal and to the Responses to Comments 71-1 and 79-1 concerning the DES review process.

**164**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous

**164**
**CONT**

other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 164 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**165**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 165 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**166**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 166 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

**169**

1 NEC would provide all services and utilities needed for the construction camp. The potential impacts of families staying in Skagway and on schools are discussed in the appropriate sections of Chapter 8.

2 Pipeline operating revenues would accrue to Northwest Energy Company, a subsidiary of the Canadian firm. Leasing income would not be likely to affect a decision on the continued operation of the railroad.

3 This concern is included in the NEC section of Chapter 8 of the FES.

4 Risk analyses have been calculated and addressed in the FES. Existing risks of spills equal to or greater than 2.4 barrels for harbors in the Greater Chatham Strait are one in-transit tanker spill every 7.2 years, one at-berth spill every 3.5 years, one onshore storage tank farm spill every 12 years, and one tank barge spill every 3.1 years. These risks are based upon historical data. It is not known whether trained pilots were aboard. We do not have data on world-wide tanker casualties; however, types and numbers of tanker casualties for eight major U.S. ports are shown below:

Tanker Casualties by Type for Eight Port Systems and
Greater Puget Sound 1969-1976
(Partial 1976 Data)

| | | Collisions | Rammings | Groundings | Fire/ Explosions |
|---|---|---|---|---|---|
| Eight Major Port Systems[1/] | Total | 147 | 120 | 229 | 24 |
| | Percent | 24% | 19% | 37% | 4% |

| | | Sinkings/ Capsizing/ Flooding | Material Failures | Other | Total |
|---|---|---|---|---|---|
| Eight Major Port Systems[1/] | Total | 4 | 76 | 18 | 618 |
| | Percent | 1% | 12% | 3% | 100% |

[1/] Eight Major port systems are Greater Puget Sound, Los Angeles, San Francisco, Boston, Delaware River, Chesapeake Bay, Gulf Coast, and New York.

5 The revised text of the sections on Port-Economic Conditions in Chapter 3 has been expanded to indicate that a vessel owner or operator is financially responsible for spill clean up to $14 million or $100 per gross ton, whichever is the lesser, under the Water Quality Improvement Act of 1970.

6 The additional tanker traffic would not be expected to affect tour or ferry traffic. The additional number of people engaged in tanker docking operations and the nature of industrial shipping would detract from the historic setting of Skagway.

**170**

1 The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that the issues raised in Comment Letter 170 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered Task Force Comments and Responses.

## General Response to Comment Letter 171

The City of Port Angeles/Clallam County Task Force submitted over 300 pages of comments on the DES (Comment Letter 126). Those comments were responded to specifically before consideration of the numerous other letters with comments pertaining to the Port Angeles and Clallam County areas. It was determined that most of the issues raised in Comment Letter 171 were adequately addressed in the comments received from the Task Force and in the responses to the Task Force comments. For responses to the comments made in this letter, refer to the numbered responses which follow and to the numbered Task Force Comments and Responses.

### Alternative Responses

1 The statement of the purpose of the proposed action has been revised in Chapter 1 of the FES, and the relevant portions of Chapter 9 have been revised to be consistent.

2 Supply conditions have been quantified in detail in the report by the Department of Energy (1979). Information from that report has been included in the FES where appropriate.

3 The Four Corners Pipeline is a 16-inch line built in 1957 to move 70,000 bpd from the Four Corners, Utah production area to southern California. At the time of its sale to ARCO it had been carrying an average of less than 3,500 bpd. The line has been reversed and currently carries about 28,000 bpd of ANS and California crude oil to the Four Corners area. The throughput could be increased to 150,000 bpd with additional pump stations. The potential market area for this line could be the refineries in northwestern New Mexico or, with a connection to the Texas-New Mexico 16-inch pipeline, to the Houston, Texas area. At this time there are no proposals to increase the throughput of the Four Corners Pipeline.

4 Refer to the Response to Comment 162-16.

5 Reallocation of existing crude oil supplies is discussed in the section on Other Alternatives in Chapter 9 of the FES.

6 BLM has no information about foreign oil interests of the NTPC.

7 The discussion of the No Action alternative has been revised in Chapter 9 of the FES. Combinations of alternatives has been discussed in the section on Other Alternatives in Chapter 9.

8 The additional costs of transshipment throught the Panama Canal would have to be absorbed by the producer and would not increase the price at which the crude oil was sold. Consumer prices in the midwest would probably be higher because of a supply deficiency.

9 The discussion of the Delayed Action alternative has been revised in Chapter 9 of the FES. The specific questions in this comment cannot be answered because they concern future actions by various independent companies.

10 The statement referred to in the comment was an evaluation of the results of a combined oil spill risk analysis. The relative "desirability" of various alternatives will depend upon many other considerations in addition to oil spill risks.

11 The risk analysis estimate is one spill every 5.2 years, as reported in the study by the Oceanographic Institute of Washington (1978).

12 Opposition to the Stampede Pass route alternative was based on the potential impacts to the Seattle and Tacoma watersheds. Note that this alternative has been deleted from the FES since it would no longer be a viable alternate to NTPC's current proposal. State and federal agencies, and private citizens expressed opposition to the Coeur d'Alene route, primarily because it would cross the Spokane-Rathdrum Prairie Aquifer.

13 Potential throughput of ANS crude was estimated at 300,000 to 350,000 bpd by the U.S. Department of Energy (1979). Neither the proposals nor the alternatives are restricted to serving only the northern tier states.

14 The discussion of the SOHIO proposal has been revised in Chapter 9 of the FES. Of the various proposals, only the one from SOHIO had been studied with an ES, so more information was available about potential impacts. Note that potential critical impacts of the NTPC proposal were identified in the DES.

15 Most of the mid-continent lines are product lines and products have priority over shipment of crude. Page 8-113 of the DES refers to some available capacity on the Seaway and Explorer Pipelines, but that capacity is controlled by product throughput and could not be a dependable throughput for crude. The statements of potential crude oil throughput in mid-continent lines refer to pipeline proposals which are currently in various stages of planning.

16 The Northville Industries port at Puerto Armuelles has been put into operation. Information on throughput at the port was not available.

17 Refer to the Response to Comment 171-7. Two of the proposals described in Chapter 1 of the FES (those of TMC and NTPC) could be connected by pipeline to supply the Puget Sound refineries.

18 Refer to the Response to Comment 171-7. Also refer to the section on Other Alternatives in Chapter 9 of the FES.

19 NTPC could use diesel fuel or a mixture of diesel fuel and bunker fuel. Diesel fuel is available with a sulfur content of 0.5 percent or less. There are currently no federal or state regulations regarding sulfur content of fuel used by ships in port. Bunker fuel would be monitored by EPA if the use of low-sulfur fuel were a stipulation in the permit issued under the federal Prevention of Significant Deterioration Regulations.

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20 The probability of oil reaching marine waters after leaking from the pipeline cannot be quantified. The precise size and location of the leak, stream conditions and other factors would affect the outcome. Refer to the Response to Comment 34-16 concerning leak detection technology and potential spill sizes.

21 Reliable quantification of potential financial losses to fisheries is not possible. Economic impacts are discussed in the sections on Economic Conditions in Chapter 3.

22 The trajectory analyses presented in the FES are for unspecified spill sizes.

23 Potential oil spill trajectories for leaks from the Cross Sound submarine pipeline have been included in the FES.

24 The acreage figures have been corrected to be consistent for each onshore storage facility alternative. NTPC has indicated that approximately 140 acres would have to be cleared for construction of the proposed facilities. NTPC has indicated that it would use a 242 acre site at Green Point and that it has an option to purchase 52 additional acres at that site. Presumably a similar area would be required at the alternative sites. Storage for 13 million barrels is not part of NTPC's proposed project.

25 The highest annual average concentration would occur about a mile east of the SPM site. Land areas would be affected during periods of onshore winds. The most likely land areas to be affected would be the shoreline between Low Point and Crescent Bay. However, concentrations would always be within the Class II incremental standards.

26 No additional ozone modeling will be performed. The extensive ozone modeling done for Port Angeles would be sufficient to assess air quality impacts for the Low Point and Freshwater Bay alternatives. Given the fact that emissions and the meteorological conditions are very similar, ozone impacts for Low Point and Freshwater Bay would not be expected to differ much from those for Port Angeles.

27 Losses would not be likely to be noticed in ocean fisheries (sport, commercial, or Indian) because of the mixing of salmon stocks from many different river systems. As stated, reductions might be noticed in a particular river affected by a spill. As such, any Indian fishery on an affected river could be affected.

28 Losses would not be expected to be noticed in the ocean fisheries because of the mixing of salmon stocks from different river systems.

29 A separate permit from the National Park Service would be required before pipeline construction across National Park lands would be allowed.

30 The two statements referred to in the comment are not in conflict. The first refers to potential impacts under normal operating conditions; the second refers to potential impacts from an oil spill.

31 The discussion of social impacts to the Lower Elwha Indian Reservation community has been revised in the section on the Freshwater Bay alternative in Chapter 9 of the FES.

32 Noise levels from electric pump stations would be approximately 40 dBA at a distance of 3,000 feet.

In the state of Washington there are no legal standards for noise levels during construction between 7 a.m. and 10 p.m.

33 It is not possible to delineate the exact boundaries of Seismic Risk Zones. The boundaries are defined in terms of regional seismicity and are subject to change as more seismic data becomes available. Approximately 8 miles of the proposed TMC route, from Port Angeles to the Green Point area, would be within a Seismic Risk Zone 3. The section on Low Point has been rewritten to include more up to date information pertaining to seismicity and slope instability.

34 Halibut were considered as ground fish in the information presented on the maps.

35 The text and the maps dealing with biological components of Marine Resources have been thoroughly revised for the FES.

36 Refer to the Response to Comment 151-1.

37 Cultural resource sites located above the tidal zone would not be expected to be affected by oil spilled into the ocean.

38 The statement referred to in the comment pertained to visual impacts. The pipeline at Low Point is proposed to go ashore in a cove (in contrast to the exposed bluff situation at Green Point) and it is not expected that there would be significant impacts on siltation patterns.

39 For the purposes of the oil spill risk analyses it was assumed that very large tankers could enter all the alternate ports. This assumption was made in order to have comparable risk analyses for each site.

40 Tank farm spill risk analyses were performed only for volumes currently proposed by the applicants. The simulation of waterway navigation was performed by the Oceanographic Institute of Washington (OIW). In the risk analyses, historical data on collisions and on collisions with oil spills were used. Other considerations such as weather conditions and congestion were not used because data on these factors was not available in a completely quantified form, as was needed for the analyses.

41 Estimated pipeline spill frequencies were calculated for the actual facilities that would be required for each alternative. Estimated spill risks from submarine pipelines connecting port facilities to storage facilities are included in the calculations. The "Not Applicable" entries in the table, for Burrows Bay and Cherry Point, indicate that there is no underwater route from those ports to North Bend.

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CONT

42 The table referred to presents estimates of cumulative in-transit, at-berth, and pipeline oil spill risks. For each port, the two columns of the table present the different estimates for the different pipeline alternatives which could be used. For any one port the in-transit and at-berth risks would be the same.

43 None of the proposed facilities would be hazards to air traffic at Fairchild International Airport. The potential impacts of the NTPC proposal to the Coast Guard air station on Ediz Hook are discussed under Transportation and Utilities in Chapter 3 of the FES.

44 BLM has no information about the relative timing of the adoption of the comprehensive Plan Amendment and NTPC's obtaining property options.

45 The onshore storage facilities for Site 3 would be the same as those proposed for Green Point. The acreage requirements would be essentially the same. The 545 acres is the size of the available property option at Site 3, not the area needed for facilities.

46 If the location and/or method of construction of the submarine pipeline do not conform with the program, if the federal government approves one of the proposals with a submarine pipeline, and if EFSEC recommends approval of one of those projects; then EFSEC would probably recommend measures to reduce or to eliminate the project features which do not comply. What specific measures might be recommended cannot be anticipated at this time.

47 Only those onshore storage facility sites proposed or identified as potential alternatives by the applicants have been included in the FES.

48 The table referred to in the comment has been deleted from the FES. However, the various acreage figures referred to have been revised to be consistent throughout the FES.

49 The questions in this comment all pertain to decisions made by NTPC and would have to be answered by NTPC.

50 The NTPC application to EFSEC was referred to as a source of information, not as a disclaimer. BLM is responsible for the entire analysis presented in the DES and the FES.

51 Residents located within 4,000 feet from the pipeline construction site would experience daytime noise levels ranging from about 50 dBA at 4,000 feet to about 70 dBA at distances of less than 500 feet. There are no data on current baseline noise levels.

52 Refer to the Response to Comment 126-Alternatives, 10.

53 Details of construction at the bluffs near Port Williams and Point Partridge are not available. It has been assumed that potential impacts would be similar in type to those expected at Green Point, but at a reduced scale because only one pipeline, in contrast to two at Green Point, would be installed.

54 Some subbottom information on Saratoga Passage, based on an unpublished report by Roberts (1978), has been included in the FES. No significant impacts on Marine geology have been identified during the course of the analysis.

55 Potential impacts on aquatic resources along the Cross Sound route are discussed in Chapter 3 of the FES, and potentially significant or critical impacts are identified in the Map Addendum. The specific statement referred to a conclusion based on analysis and professional judgement, not a quotation from some information source. The fact that pipeline construction would affect surface waters does not necessarily mean that municipal water supply systems using ground water would be affected. For example, wells could tap aquifers at a depth below the area of construction impacts.

56 The statement referred to in the comment is based on information published by the Washington State Department of Fisheries and the Pacific Northwest River Basin Commission.

57 Refer to the Response to Comment 126-Oil Spills, 1.

58 The figure referred to has been revised in the FES. Spill volumes are not specified for the trajectory analyses.

59 Potential impacts on intertidal clam beds, shrimp and crabs in the Whidbey Basin would be expected to be minor, with effects occurring in restricted areas. Beds destroyed by laying the submarine pipeline would be expected to recover within about four years. Potential economic losses from impacts to clams, crabs, and shrimp cannot be reliably estimated.

60 Potential trajectories of submarine pipeline leaks are included in the FES. Quantitative estimates of potential water quality degradation and economic losses to commercial salmon fisheries have not been included because reliable data on which to base such estimates is not available.

61 The precise alignment of any pipeline route along existing transportation and utility corridors would be determined on the basis of consideration of the characteristics and present and future needs of the existing corridors, any applicable stipulations to state and federal permits and the requirements of the pipeline. Eminent domain would not establish any criteria for pipeline route alignment.

62 Yes, the pipeline right-of-way would be considered a utility corridor regardless of whether or not it delivered any of its throughput to the political units that it crossed.

63 Quantitative data has been included where possible. However, reliable quantification of potential oil spill impacts on recreational resources is extremely difficult because of the many variables affecting both oil spills and the resources.

64 Refer to the sections on Pipeline System Social Conditions and Economic Conditions in Chapter 3 of the FES for assessments of impacts from construction workers along the Cross Sound route segment.

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**CONT.**

65 All cost estimates in the FES have been revised to be consistent with the current proposals from the applicants and to be as up-to-date as possible.

66 The discussion of the Stampede Pass alternative has been deleted from the FES, because it is no longer a viable alternative to any of the proposed pipeline routes.

67 Oil diverted from the TAPS at mile 545 might have to pay the full tariff, as if delivered all the way to Valdez. If not, tariffs on the remaining throughput to Valdez would probably be increased.

68 The Trans Mountain proposal which is described in Chapter 1 and analyzed in Chapter 8 of the FES is that company's current proposal, presented as its application for consideration under Title V of PURPA.

69 The SOHIO project included a proposal for a storage facility on 42 acres of land with 8 tanks for approximately 5 million barrels of storage. Information on acreage requirements for storage facilities for the Trans Mexico and Trans Guatemala systems was not available.

70 Refer to the Response to Comment 126-Alternatives, 12.

71 Refer to the Response to Comment 126-Alternatives, 15.

72 Refer to the Response to Comment 126-Alternatives, 16.

73 Refer to the Response to Comment 126-Alternatives, 16.

74 Refer to the Response to Comment 126-Alternatives, 13.

75 Refer to the Response to Comment 126-Alternatives, 13.

76 The expansion of the Mid-Continent network would require approximately 2,030 miles of additional pipeline (756 miles for Texoma, 476 for Northern, 163 miles for Williams, and 635 miles for LOOP). The amounts that would be on existing and on new right-of-way are not known.

77 First of all, there is no legal way of creating new non-attainment areas. Before permission to construct a new source could be granted, it must be determined that the new project would not cause the violation of any of the ambient air quality standards. However, construction of a new source in an area where standards are being met, while not causing violation of the standards, would cause some degradation in air quality in the area. Construction of a new source in a non-attainment area would result in no change in air quality in that area because of the trade-offs required. The general philosophy of the Clean Air Act Amendments of 1977 is to protect areas with relatively pure air from significant air quality deterioration. For that reason incremental limits were established as part of the Prevention of Significant Deterioration regulations. Therefore, limited industrial growth can be allowed while at the same time allowing air quality levels to stay within acceptable limits. It is difficult to tell which approach is most environmentally sound. Any final decision on locating a project would have to be made after weighing a combination of many other environmental factors such as water quality, wildlife, economics, etc.

78 The Northern Pipeline, which is still in the proposal evaluation stage, was to have been in operation late in 1980. Although some permits have been granted, problems in securing right-of-way permits in Iowa may extend that time estimate. This line could not directly supply any of the northern tier states west of Minnesota.

79 The Panamanian Transshipment Port was completed in December, 1978.

80 To the extent possible, comparable economic data on the various alternatives has been provided in the FES.

81 The table referred to in the comment has been corrected and updated.

82 The FES has included this revision to the NTPC proposal. NTPC would provide the low sulfur fuel in order to have its project comply with Class 1 Air Quality Standards. Therefore, the low sulfur fuel would probably be included in an EPA permit. EPA would presumably be responsible for monitoring and enforcement; however, EPA could transfer that responsibility to the state.

83 At the time of preparations of the DES, the Pace report was the principal source of available information. The text of the FES has been revised to utilize information from the Department of Energy wherever feasible.

84 The possibility of additional petroleum-related industry is discussed in the revised section on Port-Economic Conditions in Chapter 3 of the FES.

85 The discussion in Chapter 3 refers to air quality impacts during actual abandonment procedures. After the abandonment process has been completed, air pollutant levels would drop by a certain amount.

86 Proposed Stockpile locations are shown in the section on NTPC's proposal in Chapter 1 of the FES.

87 NTPC has revised its Application For Site Certification to EFSEC. The FES does contain consideration as to the consistancy of NTPC's proposal with the provisions of the WCZMP.

88 A discussion of public opinions opposing and supporting the proposed project is contained in the Social Conditions sections of the FES. References to the number of signatures on petitions have been deleted from material in the FES.

**172**

1 The questions and concerns raised in this letter have not been responded to item-by-item in this space. Refer to the responses

**171** CONT. to Comment Letters 34, 51, and 120 where many specific issues related to the potential impacts of the NTPC proposal in western Montana are addressed.

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1 These concerns have been considered in the revision of the section on Pipeline System Topography/Geology in Chapter 2.

2 These comments were considered when the sections on Topography/Geology in Chapters 2 and 3 were rewritten to cover NTPC's Cross Sound route proposal. The occurrence of several low level earthquakes (less than 6 Richter) in the region has been mentioned. Also refer to the Response to Comment 151-3. If the NTPC proposal is approved and implemented, excess material would be disposed of in ways at the discretion of land owners, with determinations being made when NTPC obtained easements.

3 The statements referred to in this comment are correct even though quite general. They were taken from the USDA publication, "Soil Survey - Island County, Washington, 1949." The FES includes a more detailed treatment of soil impacts in Island County.

4 Refer to the Response to Comment 161-2.

5 The potential impacts on marine biology are discussed in the sections on Marine Resources in Chapter 3. The potential impacts on freshwater biological resources are discussed in the sections on Aquatic Resources in Chapter 3.

6 Inferred oil movement is discussed in the FES. It is true little information is available on oceanographic conditions in the Whidbey Basin. Also refer to the Response to Comment 158-5.

7 The purpose of BLM's ES is to analyze and discuss the potential impacts of the various proposals. This includes identifying possible adverse impacts, but does not include making judgements on NTPC's proposal.

8 The appropriate sections have been revised to address terrestrial vegetation that would be affected by NTPC's Cross Sound route.

9 This issue has been addressed in the revisions of the sections on Terrestrial Wildlife in Chapters 2 and 3.

10 Ebey's Landing National Historic Reserve is identified in the table of Historical Resources in the section on Pipeline System Cultural Resources in Chapter 2 of the FES.

11 These issues are addressed in the Visual Resources sections of Chapters 2 and 3 of the FES.

12 Refer to the Response to Comment 158-9.

13 Refer to the Response to Comment 158-9.

14 The sections on Recreation in Chapters 2 and 3 have been rewritten to include a section on Tourism. Because the location, time, and magnitude of an oil spill cannot be predetermined, it is impossible to identify the number of tourists which would be affected.

15 Refer to the Response to Comment 158-11.

16 Estimated total and local employment during the construction period for Island County is given in the table in the section on Pipeline System Economic Conditions in Chapter 3 of the FES. These revised estimates were derived utilizing the approach and assumptions outlined in the discussion of general economic methodology in that section.

17 The error has been corrected. Also refer to the Response to Comment 158-11.

18 Recognition of the restricted availability of adequate fire protection services in rural areas along the proposed alternative pipeline route is mentioned in the sections on Social Conditions in the FES.

19 Data on police protection service employment are included in the table on Community Resources for Counties in the section on Pipeline System Social Conditions in Chapter 2. Potential impacts on police protection services are discussed in the sections on Social Conditions in Chapter 3.

20 This information was considered during preparation of the sections on Social Conditions for the FES.

21 Island County would receive an estimated $195 thousand additional sales tax during the initial construction phase, while the State of Washington would gain an estimated $22 million in sales tax revenues from project expenditures during the same period.

Pipeline property would increase the property tax base of Island County an estimated $20 million, and generate an additional $204 thousand in property taxes during the first year of operation (without allowances for depreciation in subsequent years). Although these revenues would lag after costs for additional county/local governmental services associated with the project were incurred, they should be offsetting. Any remaining net could be used to provide increased services or lower taxes for local property owners.

22 Initial construction costs will be paid for by the corporations involved, but will ultimately be passed on to the consumer, in the same manner as other projects of a similar nature.

23 The section on Pipeline System Social Conditions in Chapter 3 indicates no population or infrastructure impacts for Island County due to the relatively short time period the pipeline construction crews would be in the area, thus placing minimal pressure on local government for increased services. Estimated economic losses of major fishery resources in the area from

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construction activity and a general assessment of possible losses associated with a large oil spill are included in the revised sections on Economic Conditions. Evaluation of the potential impacts of construction and operation on tourist activities focused on the Port Angeles area. An estimated $3.9 million of personal income would be generated in Island County over the course of the construction period, plus 70 additional local jobs during the peak construction period. Island County would receive an estimated $195 thousand in sales tax during the construction phase and $204 thousand in property tax for the first year of operation, without allowance for depreciation in subsequent years. Implementation of the proposed action would result in both beneficial and adverse effects on the residents of Island County. Damages from a pipeline rupture or tanker spill would be subject to compensation by the responsible party.

**176**

1 The area in question is Section 16, T151N, R52W and not R25W as indicated in the comment letter. The sections in Pipeline System Land Use in Chapters 2 and 3 have been revised to include this information.

2 Refer to the Responses to Comment 113C-6 and Comment 23-1.

**177**

1 Refer to the Introduction to the FES for an explanation of the role of this FES in the process of U.S. decision making about crude oil transportation systems.

2 Refer to the Response to Comment 86-6 concerning the values of commercial fisheries. The text and table in the section on Port-Economic Conditions in Chapter 2 of the FES have been revised and updated to reflect new data supplied by Canada's Department of Fisheries and Environment. Also refer to the discussion of Executive Order 12114 in the Introduction to the FES concerning decisions about the extent to which Canadian resources have been analyzed in the FES.

**180**

1 It was decided not to include off-shore oil spill risks in this ES because they were recently evaluated in the EIS on the SOHIO proposal (U.S. Deparment of the Interior 1977b). This FES includes revised discussions on oil spill risk and trajectory analyses. The sections on Marine Resources and on Economic Conditions in Chapter 3 of the FES have been considerably revised to be consistent with NTPC's current proposal.

2 The section on Port Recreation in Chapter 2 has been revised to address more comprehensively the value of the sport fishery.

3 Refer to the Response to Comment 158-9.

4 Detailed analysis of Canadian resources is not within the scope of the ES. The Introduction to the FES discusses the Executive Order pertaining to this issue.

5 Retrofitting west coast refineries and swaps with Japan have been considered in the section on Other Alternatives in Chapter 9 of the FES.

L-6

1 NTPC's proposed route no longer parallels Hood Canal. The description of waterfowl has been expanded in the FES. Site specific surveys are not available for most of the stream crossings.

2 Significant impacts to wildlife resources along Benewah Lake, St. Joe River, Cave Lake and Coeur d'Alene River are described in Chapter 3, Terrestrial Wildlife. Only the most significant impacts on the life history of wildlife are discussed.

3 This factor was considered during the revision of the sections on Terrestrial Wildlife and Terrestrial Vegetation in Chapters 2 and 3 of the FES.

4 Refer to the first two paragraphs of the General Response to Comment 126. In addition, several of the points contained in Comment L-6-4 refer to portions of the pipeline route which are now route segment alternatives and are addressed only in Chapter 9 of the FES. A few comments point out inconsistencies between the description of the NTPC proposal and the section of the DES called "Additional Measures Proposed for Environmental Protection." That section has been deleted from the FES and the measures have been incorporated into the project description where appropriate. The information contained in the comments pertaining to Fish and Wildlife Service activities has been included in Chapter 1 of the FES. The two photographs referred to have been deleted from the FES. The drawing of a pipeline construction spread has been retained as an illustration of a typical construction sequence. It is not intended to illustrate impacts which are considered in Chapters 3 and 8. The suggested mitigation measures were considered when the revisions of Chapter 4 were made.

5 Site specific investigations have not been conducted to assess aquatic invertebrate resources but they are discussed generally and briefly in the section on Pipeline System Aquatic Resources in Chapter 2. Impacts on aquatic invertebrates are addressed generally in Chapter 3. Stream classifications are identified in Chapter 2.

6 Fisheries resources in Siebert Creek are identified in Chapter 2. The text has been revised to include discussion of impacts on Siebert Creek associated with onshore storage facilities in Chapter 3.

7 These comments were considered during the rewriting of the sections on Biological Components of Marine Resources.

8 The mammal section is being completely revised due to recent information furnished by NOAA-PMEL. This revision will also be reflected in the "Threatened and Endangered Species section.

9 Refer to the discussion of Executive Order 12114 in the Introduction to the FES concerning the treatment of Canadian resources.

10 The importance of mud (or mudflat habitat) is addressed in the table on Classification of Habitat Types in the section on Port-Marine Resources in Chapter 2. Also, more information on marine birds has been included in the FES.

11 The sections on Terrestrial Wildlife in Chapter 2 and 3 discusses in detail the wildlife resources at Green Point which may be significantly affected by the NTPC proposal.

12 According to 1977 Washington Department of Fisheries statistics, approximately 20 percent of the bottomfish sport catch is from the area from Neah Bay to approximately Gray's Harbor. Over 60 percent is caught in Central Puget Sound.

13 The section on Port-Recreation in Chapter 2 has been revised to address these concerns.

14 According to 1977 Washington Department of Fisheries statistics, only 8 percent of the sport bottom fish catch occurs in the Strait. Of the sport salmon catch, only 12 percent occurs in the Strait.

15 Only 5 percent of the sport bottomfish catch is from the North Puget Sound area.

16 Refer to the Response to Comment 126 - Tourism/Recreation, 29.

17 Refer to the Response to Comment 126 - Tourism/Recreation, 29.

18 The data presented in the table has been reviewed and is considered adequate.

19 The table on Covered Employment in the section on Port-Economic Conditions in Chapter 2 has been revised to include the category, Agriculture, Forestry and Fishing. Data on employment in fishing is not normally reported separately because the amount of employment is relatively small and occurs sporadically. The trade and food manufacturing industries may also include some small amount of employment related to fishing activities. The tourist industry represents essentially the local consumption demand of non-resident visitors, and as such does not correspond with normal industrial classifications, so directly relevant data is not available. The trade and service industries are the principal industries affected by tourist activities. The significance of tourism is discussed in the section on Port-Economic Conditions in Chapter 2.

20 Significant fishery values are identified in the section on Pipeline System Aquatic Resources in Chapter 2. Also refer to the Response to Comment 76-10 concerning identification of major streams.

21 NTPC proposes to construct the project according to the schedule presented in the NTPC section of Chapter 1. Required coordination with appropriate state and federal agencies is also indicated in that section.

L-6
CONT

22 Only freshwater fishery resources are discussed in the sections on Aquatic Resources. Marine resources are discussed in separate sections. The around Puget Sound route now appears in Chapter 9 as a route segment alternative.

23 The appropriate section of the FES has been revised to include mention of the need for sediment-free gravel.

24 It has been determined that because of project size and length, the level of detail of both project design and impact analysis, and the scope of this ES, the information presented is adequate.

25 Refer to the Response to Comment 141-22.

26 Only the more productive streams which support at least 3 species of salmon were included in this table in the DES. The streams identified in this table are now addressed in Chapter 9, in the section on The Around Puget Sound Route Segment Alternative. The table was deleted from the FES since impacts on these fish populations were only discussed generally and not quantified.

27 Refer to the Response to Comment 141-24.

28 The terrestrial vegetation section has been revised. Refer to the section on Pipeline System Vegetation in Chapter 2 for discussion of wildlife habitats of special concern.

29 Definitions for identifying significant and critical impacts are provided in Chapter 2 - Terrestrial Wildlife. Data provided by federal, state and local agencies provided the baseline information. The conclusions drawn resulted from analyzing wildlife habitat requirements and sensitivity of wildlife species and habitats to potential impacts. The tables on potential impacts explain many of the impacts described generally in the text of Chapter 3.

30 The proposed pipeline is not expected to affect the essential wolf habitat near the Clark Fork River Valley, and therefore, was not addressed. No sightings were identified near the corridor in Montana.

31 The table on potential impacts on non-endangered species identifies impacts to Upland game birds and deer and in Chapter 3 there is a description of the importance of the diminishing wooded habitat. Other values of wetlands crossed by the pipeline have not been inventoried. The information available is recognized as being incomplete but until the centerline of the pipeline is determined and surveyed much of this information cannot be obtained.

32 Only impacts of wetlands along the corridor were included in computing the 247 miles of prairie potholes. Acreages from type III, IV and V wetlands were not used since insufficient information was available. The wetlands would still need to be inventoried when the exact centerline of the proposed route is determined.

33 The areas of special concern in the FES have been expanded to include seasonal distributions where significant impacts are expected to occur.

34 For the FES, the portion of NTPC's proposed route from the Missouri River to the Red Lake River was examined for prairie potholes. This extended the coverage to include the area between Williston and Minot. Picture captions have been corrected.

35 Bottomfishing may be of high interest, however, less than 1 percent of the recreational bottomfish catch occurs in Hood Canal.

36 This information has been noted. However, it was not included in the text of the FES. The areas referred to in the comment are now discussed in the section on the Around Puget Sound route segment alternative in Chapter 9.

37 The asterisks were identified in the beginning of the Chapter in the DES and denoted the portions of the narrative which were no longer pertinent to NTPC's proposed route. All parts of the FES have been revised to be consistent with NTPC's proposal as of April 16, 1979.

38 Raft culture has been considered and included. It is not known to what extent pen rearing of salmon would be a significant contribution to the resource base in the future; therefore it was not included.

39 The statement accurately identifies a potential impact which could occur in the future. It is true that eagles can be protected; however, in the case of Green Point, no protective measures have been initiated in response to the routine types of development that have taken place up to the present.

40 Refer to the Response to Comment L-6-38.

41 Screens would be used when pumping ballast water; however, it is not known whether the smallest fish would be filtered out. In any case the number of fish that might be pumped into the empty tanks would be very small.

42 Since the DES was issued, NTPC has modified its proposed method of constructing the pipeline on the bluff at Green Point; thereby reducing the potential impacts. Various sections of the FES have been revised to be consistent with NTPC's current proposal.

43 According to the NTPC proposal the 140 acres refers to both Phases I and II.

44 The relative stability of the bluff at Green Point has not been established. Based on a bluff erosion rate of 3 inches/year, about 7000 $yd^3$ of sediment would be contributed to littoral drift during the 20 year life of the project. The impact to Dungeness Spit would be insignificant. The impacts of a slump could not be assessed without knowledge of the magnitude of slumping, in $yd^3$. Also refer to the Responses to Comments 126-Geology, 15 and 16.

45 The section on Soils in Chapter 5 discusses what happens to the tons of soil displaced by water erosion. The sections on Port-Soils in Chapters 3 and 5 have been changed to more adequately document the statements about bluff erosion.

L-6 CONT

46 NTPC proposes to place impervious material below the tanks and holding basins at the onshore storage facility site.

47 The potential impacts on fisheries resources from increased runoff are discussed in the sections on Aquatic Resources in Chapter 3.

48 The bacteriacide has not been identified by NTPC. Dilution needs were provided by NTPC without supporting data.

49 These resources are identified in the Map Addendum.

50 Refer to the Response to Comment L-6-7.

51 Drift is mentioned in the appropriate section of Chapter 3 of the FES.

52 There is this possibility; however, baseline data on sediment bound heavy trace metals and other contaminants, such as chlorinated hydrocarbons are lacking. Some limited hydrocarbon data is available and included in the FES.

53 Refer to the Response to Comment L-6-7.

54 The 87,000 barrels is an example only and should not be related to risk analysis. Definitive data on bird numbers and bird types are not available; therefore, mortality estimates were not included.

55 There are no documented observations that such circumstances could or would occur. However, it could be a potential impact.

56 Chances for food poisoning of humans would be very slim. However, depuration rates for various crude oil components are not well studied and such compounds at benzo-α-pyrene could be incorporated into tissues and remain in them for a long interval of time.

57 Refer to the Response to Comment L-6-7.

58 The photograph caption has been changed.

59 Refer to the Response to Comment L-6-7.

60 The intent of the Table was not to incorporate all possible combinations and permutations, but to combine information on vulnerability of habitats and vulnerability of marine biota, which is included in other tables in the same section of Chapter 3.

61 The principal economic losses which might be sustained beyond the project life involve possibly diminished fisheries harvests of several years duration. These would be small in comparison with other project benefits and costs and would not significantly affect a comparison of benefits and costs. A benefit-cost analysis will be presented in a report by the Department of Energy.

62 These issues were considered in revisions of the Terrestrial Wildlife sections of Chapter 3.

63 The concept of displacement and reduction of species is discussed in the Terrestrial Wildlife sections of the FES.

64 Wintering and breeding bald eagle habitat is discussed in the FES in the Terrestrial Wildlife sections of Chapters 2 and 3. Other wildlife species are also discussed in the FES.

65 The appropriate section has been revised in the FES.

66 No information concerning this issue could be found.

67 The sections on Recreation have been rewritten for the FES. Potential impacts have been quantified when adequate data were available. Also refer to the sections on Economic Conditions.

68 Refer to the Response to Comment 126-Tourism/Recreation, 31.

69 A worst case impact was not figured because there is insufficient data on oceanographic and climatological conditions, and the magnitude of the spill. Refer to the sections on Risk Analysis in Chapter 3 for a discussion of the factors involved in identifying movement of oil from a leak or spill. Refer to the Response to Comment 34-16 for a more detailed discussion of leak detection.

70 The discussion of economic impacts of fisheries has been revised in the sections on Economic Conditions in Chapter 3. In the event of an oil spill, impacts on salmon would be mainly at river mouths where salmon might be delayed in spawning or smolts going to sea might be affected. Migrating salmon, seeking to avoid the spill, might be delayed in their migration. The impact on the current salmon harvest is considered indeterminate. If the current year's production were affected, the salmon harvest in a subsequent year would be reduced. This impact has not been quantified as discussed in the section on Port-Economic Conditions in Chapter 3.

71 The cost of cleaning up a specific oil spill has not been determined. Success of clean-up before a spill affected shore areas would be highly dependent on wind and water conditions. The extent of clean-up of shore areas would be dependent on the degree to which clean-up efforts could reduce additional environmental damage. Detailed description of clean-up activities is considered to be beyond the scope of the ES. Specific mitigation measures would be addressed in permit stipulations.

72 The section on Port-Economic Conditions in Chapter 3 has been revised. Fishermen and others experiencing direct economic loss would be entitled to recompense from the responsible parties.

73 The introduction to the sections on Topography/Geology in Chapter 3 indicate that geologic events lead to impacts to other resources, including marine and terrestrial organisms. Impacts on these resources are identified in their appropriate sections.

74 As the proposed pipeline would be constructed below scour depth, potential impacts resulting from spring floods are not considered a serious hazard.

75 It has not been determined whether or not erosion would be considered a point source discharge. Point source discharges would be subject to NPDES permits.

76 Impacts on fishery resources are addressed in the section on Pipeline System Aquatic Resources, and impacts on wetlands are addressed in the section on Pipeline System Terrestrial Vegetation in Chapter 3.

77 A discussion addressing oil spill clean up has been included in the revision of the section on Pipeline System Aquatic Resources in Chapter 3. Refer to the Response to Comment L-6-5 concerning aquatic insects.

78 These factors were considered in the assessment of potential impacts on aquatic resources.

79 This information has been noted; however, potential impacts at this level of specificity have not been incorporated into the FES.

80 A discussion of screening has been included in the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

81 The potential impacts on pink salmon have been incorporated into the revision of the section on Pipeline System Aquatic Resources in Chapter 3.

82 A worst-case profile has not been shown because of the number of variables involved in such an analysis.

83 The discussions of potential impacts from oil spills have been revised throughout the ES. Refer also to the new sections of Chapter 3 on Risk Analyses, and to the Response to Comment 34-16 concerning leak detection systems.

84 Currently available data does not permit an analysis of this depth to be made, nor is such an analysis within the scope of this ES.

85 Refer to the Response to Comment 25-2.

86 Refer to the Response to Comment L-6-80.

87 This concern has been considered in the revision of the section on the Around Puget Sound route segment alternative in Chapter 9 of the FES.

88 This comment has been considered in the revision of the section on the Around Puget Sound route segment alternative in Chapter 9. Rearing habitat occurs in most streams and potential impacts in these areas would include: 1) reduced aquatic insect production because of sedimentation and oil contamination of gravel; 2) reduced hiding cover for juvenile fish because of sedimentation of gravel; and 3) mortality to aquatic insects and juvenile fish from oil contaminated water. Potential impacts on shellfish in marine waters are addressed in the sections on Marine Resources in Chapter 3.

89 The statement was deleted from the FES.

90 Potential impacts to marine resources are addressed in the Marine Resources sections of Chapter 3.

91 Estuarine areas have been added to the list of deposition sites in the section on Pipeline System Aquatic Resources in Chapter 3.

92 Refer to the Response to Comment L-6-81.

93 This point was considered during the revision of the section on Pipeline System Aquatic Resources in Chapter 3 of the FES. Potential impacts on shellfish are addressed in the sections on Marine Resources in Chapter 3.

94 It is doubtful that sediments would affect shell fish beds. For example, in still water coarse clay particles (0.00195mm) settle at 0.026 ft/hr while very fine sands settle at 26.3 ft/hr. Once silt and clays are suspended turbulence tends to keep them in suspension. Good discussions of this may be found in Lauff 1967, p158 and Hjulstrom 1939.

95 Refer to the Response to Comment L-6-7.

96 Any residue deposits would be disposed of in a way consistent with applicable regulations at the time of abandonment. Refer to the Response to Comment 27-25 concerning disposal of oily wastes.

97 Additional information on adverse vegetational impacts from oil spills has been included in the revised section on Pipeline System Terrestrial Vegetation in Chapter 3.

98 A discussion of potential adverse impacts on endangered plants is now included.

99 The discussion of impacts in nesting bald eagles in the Terrestrial Wildlife section of Chapter 3 has been revised. Route changes have altered the expected impacts to bald eagles and these are included in the table on Impacts to Endangered Species. All of the proposed route has not been surveyed for bald eagle nests, therefore, it is recognized that unknown nesting areas also may be impacted.

100 NTPC has not provided specific chemicals to be used; however, the statement stipulates the use of herbicides instead of aerial spraying, and mechanical removal in areas critical to threatened and endangered species. Impacts from removal of the limited wooded habitats in North Dakota are discussed in the FES.

101 This concern has been noted. No specific revisions were made because it was not possible to obtain the information required to adequately assess this potential impact.

**L-6 CONT**

102 Most of the rivers along the proposed and alternate routes have not been inventoried for harlequin ducks, sea ducks and other waterfowl. The format of the FES is to analyze areas where wildlife resources are known, however, it is recognized that Hood Canal and the mouths of rivers also provide important habitat for these birds.

103 The proposed corridor could potentially cross Waterfowl Production Areas. However the exact centerline of the pipeline has not been decided and rerouting or other mitigation measures would have to be determined when the precise right-of-way alignment is identified.

104 Chapter 4 has been revised in the FES. Refer to the introduction to Chapter 4 for an explanation of BLM procedures for handling mitigation measures in this ES.

105 Impacts resulting from human disturbance including noise are analyzed in the Terrestrial Wildlife Sections of Chapter 3. Noise could cause eagles to abandon Green Point, and could reduce available habitat for other wildlife species in the area.

106 Refer to the Responses to Comments 62-5 and L-6-42.

107 The section on Port-Soils in Chapter 5 was changed to reflect this comment.

108 Impacts on biological resources are discussed in their appropriate sections. The impacts of a major slide on the natural erosion of the bluff and the effect of tidal washing on Dungeness Spit cannot be assessed without knowledge of the magnitude of the slide and the direction of sediment movement. Also refer to the Responses to Comments 62-5, 12-Geology, 15 and 16, and L-6-42.

109 Refer to the Response to Comment L-6-42.

110 This concern has been addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

111 Potential impacts on fisheries resources in Seibert Creek has been addressed in the revised section on Port-Aquatic Resources in Chapter 5.

112 Refer to the Response to Comment L-6-7.

113 Nonendangered species are discussed in the Terrestrial Wildlife Sections of Chapters 2 and 3 of the FES. Chapter 5 includes only species expected to be impacted by residual adverse impacts which cannot be mitigated. Significant residual impacts would primarily influence bald eagles at Green Point. Impacts to other species have been considered.

114 Refer to the Response to Comment L-6-69.

115 Noise is considered a part of human disturbance and human activity which is discussed throughout the statement. Noise is not discussed as a separate impact since the results, displacement, disturbance and reduction of wildlife resources, also occur from many human activities associated with the project.

116 Proposed screen sizes have not been indicated by NTPC. Potential impacts from hydrostatic testing are discussed in the section on Pipeline System Aquatic Resources in Chapter 3.

117 Refer to the section on Pipeline System Aquatic Resources in Chapter 3 for a more detailed discussion of specific impacts.

118 The characterization of this impact as "moderate" has been deleted.

119 Wetland drainage is discussed in Chapters 2 and 3. Present information about NTPC proposed route indicates that approximately 8 miles of permanent wetlands would be crossed. When the centerline of the route is determined these wetlands could be avoided. Some wetland drainage in other unknown areas is possible; for example, in areas where seasonal moisture varies the size of wetlands or along riparian habitat. Presently available information does not indicate any significant potential impacts in these areas, except in the prairie pothole region. This area is discussed in the FES.

120 The discussion of effects at Green Point Bluff, in Chapters 3 and 5 has been revised in accord with the changed proposal. No effect on the soils of Dungeness Spit is foreseen.

The discussions of wildlife and recreation have been expanded.

121 Minor alternatives and a mix of these alternatives have been discussed in Chapter 9 of the FES.

122 The Pike Lake bald eagles have been mentioned in the FES.

123 Refer to the appropriate sections of Chapters 1 and 8 for discussions of the proposals from Trans Mountain and Northwest Energy (Foothills).

**L-18** **A**

1 Outer Continental Shelf crude oil is included in the continental United States domestic crude oil source in Table 3 - Forecasted Crude Oil Supplies, 1980-2000 in the Introduction of the FES.

2 The FES has been revised to delete the incorrect reference to the Marine Mammals Protection Act and to include the approporiate information contained in this comment.

3 Chapter 1 of the FES has been revised to include the information contained in this comment.

4 Although large diesel driven tankers are in existence presently, most tankers, foreign and domestic, are powered by steam turbine engines. This is supported in a technical document by R.R. Goodrich, Jr., et al. entitled "Survey of Ship Discharges", July 1974 prepared for the Maritime Administration.

Northern Tier Pipeline Company has committed itself to requiring all tankers to burn low-sulfur, No. 2 diesel fuel while operating in port. The air quality impacts resulting from the use of this fuel have been assessed in the FES.

5 The fuel that would be used by tankers in Port Angeles harbor would be No. 2 diesel fuel. BLM questioned Butler Associates, Inc. (NTPC's engineering contractor) about the feasibility of having steamship's burn diesel fuel while in port. Butler Associates indicate that no problems would be anticipated, and no modifications of the tankers' engines would be needed.

6 The information on segregated ballast tanks was obtained from the world-wide tanker register by H. Clarkson & Co. Ltd. This information shows that about 83 percent of the existing U.S. vessels and about 71 percent of the existing foreign vessels have segregated ballast capability. BLM used the data on existing tankers. However, it should be noted that recent amendments to the Ports and Waterways Safety Act of 1972 would require all tankers visiting U.S. ports to be equipped with segregated ballast tanks no later than 1985.

7 Such discussion would be speculative, and has not been provided in the FES.

8 The values represent risks associated only with the proposed NTPC throughput capacity of 933,000 bpd, and not the existing and incremental risk.

9 Chapter 9 has been corrected to indicate the present status of the LOOP deepwater port facility project.

C

1 Where data was available, estuarine flow has been added to the PMEL model and the results discussed in the FES. The errors in the text have been corrected and the figures have been changed.

2 Data about oil spills from other sources within the Greater Puget Sound area are included in the FES. Data for underwater pipeline spills for the years 1971 to 1977 from the USGS Outer Continental Shelf Event File and USCG PIRS data for 1973 to 1977 was used.

3 Details concerning corrosion inhibitors, bactericides, and water temperature differences have not been provided by NTPC. However, conformance with water quality standards through NPDES permits should ensure that no significant impacts would result from either hydrostatic or wastewater discharges.

4 The sections on Biological Components of Marine Resources were completely rewritten for the FES. These comments were considered during rewriting.

5 The figure has not been changed; however, the comment was considered when the text was rewritten for the FES.

6 This comment has been considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 2. It is recognized that juvenile salmon and trout would be affected and these impacts are discussed briefly. The greatest impacts would occur in spawning areas which are discussed in detail. It is doubtful that an entire year class would be exterminated since only a portion of a stream's population would be likely to be affected.

7 Refer to the Response to Comment L-18C-4.

8 Refer to the Response to Comment L-18C-4. Also note that NTPC's current proposed route goes across Puget Sound. NTPC's former proposed route is discussed as the Around Puget Sound route segment alternative in Chapter 9 of the FES.

9 Around Sound is now an alternative route. Indeed, Hood Canal does become highly stable and stratified during the summer and the flushing time can be as long as 177 days (mean flushing) (See Friebertshauser and Duxberry 1972).

10 Refer to the Response to Comment L-18C-4.

D

1 These comments were considered when the section on Biological Components were rewritten. The hydrocarbon baseline data, for selected sites, has been included in the FES. Also, Ebbesmeyers' drifter work has been addressed. Ebbesmeyers ongoing research on subsurface currents will not be available in time to include in the FES. The FWPCA model has been replaced by the more current ITT model for Port Angeles. The term "vicinity" refers to tidal current stations monitored by NOS and published in their tables.

2 See Response to Comment L-18C-9.

3 The importance of these factors is recognized. The text was reviewed and it was determined that no changes were necessary to ensure that potential impacts were adequately addressed.

4 Refer to the Response to Comment L-18C-4.

5 A spill at the entrance to Rosario Strait has been included in the FES. The discussion is based upon the final PMEL Trajectory Report and the Open Water Oil Spill Trajectory Report by the Oceanographic Institute of Washington.

6 The locations of seal areas, furnished by NOAA-MESA have been included in the FES. The Marine Resources maps in the Map Addendum identify underwater recreation parks for scuba diving in the Burrows Bay area.

7 The section on Port-Recreation in Chapter 3 has been revised to indicate potential impacts from oil spills to park areas along the Strait of Juan de Fuca. The park at Crescent Bay and the sport salmon fishing areas along the Strait have been indicated on the Marine Resources maps in the Map Addendum. The waterfowl maps have been revised.

8 The potential impacts to the Crescent Bay recreational areas are discussed in the section on Port-Recreation in Chapter 3 and in the section on the Trans Mountain proposal in Chapter 8. Also refer to the Response to Comment L-18D-7.

9 The Marine Resources maps have been revised and new maps have been added in the FES. Many of the points raised in this comment were corrected in the revisions of the maps and the alignment sheets. However, adequate information was not available for some resources, such as the eelgrass beds, and they were not added to the maps.

L-18 CONT **E**

1 This information in ERL 399-PMEL 29 has been included in the FES, where applicable.

2 Ebbesmeyer's surface drifter study has been discussed in the FES.

3 The final report from PMEL on trajectories is incorporated in the FES and surface card drifter data for the Strait and Port Angeles have been discussed.

4 The frequency of oil spill magnitudes in-transit and at-berth have been included in the FES.

5 The net estuarine flows have been incorporated in the PMEL trajectory model and are reflected in the results presented in the FES.

6 Volume throughput was not used as an exposure variable for the submarine pipeline segment. Pipeline mile was used.

7 The Oceanographic Institute of Washington (1978) reports offshore pipeline risk as 0.00084 ± 0.0059 spills per mile per year and onshore pipeline risk as 0.0022 ± 0.0024 spills per mile per year. The results pertaining to offshore pipelines were calculated from data in the USGS Outer Continental Shelf Event File for the years 1971 to 1977, for 9,990 offshore pipeline miles, and for spills greater than 2.4 barrels. The differences between these results and those presented in this comment are most likely because of the different data bases used in the calculations.

8 Corrections have been made and data submitted by PMEL incorporated in the FES.

9 The toxicity of weathered crude oil is controversial, but without research results on the toxicity of residuals, such as the asphaltic fractrons, one can argue that the weathered oil is less toxic. The volatile fractrons and seawater soluble fractrons are diluted by diffusive processes and transported from the area of a spill by advection. Of course, advection also transports the crude oil residuals.

10 In the section on Port-Recreation in Chapter 3 it is mentioned that an oil spill could have critical effects.

**F**

1 Refer to the Response to Comment L-18C-4.

2 If the NTPC proposal is authorized, detailed stipulations regarding all environmental concerns would be developed in the right-of-way grant for federal lands. The ES process identifies potential impacts and mitigative measures, which could be developed into such stipulations. The stipulations could establish state-federal monitoring teams, but this cannot be known at this time. Much of the TAPS experience pertains to pipeline construction in an Arctic environment which would not apply to the NTPC system. For many project components NTPC has indicated that it would use state of the art technology-some of which was developed and/or is being used on the TAPS line. Refer to the section of Chapter 1 describing the NTPC proposal. Also refer to the Response to Comment 34-16 concerning leak detection systems, TAPS, and the NTPC proposal.

3 Chronic low level pollution is discussed in the rewritten Marine Resources sections of Chapters 2 and 3.

4 Oil water separators would contain coalescing filtering which could scavenge the water-soluable fractions from the effluent.

5 The table of stream crossings has been deleted from Chapter 1 of the FES. Some, but not all, stream crossings are specifically discussed in the sections on Aquatic Resources in Chapters 2 and 3. Significant anadromous fish populations which could be affected are identified in Chapter 2. Also refer to the Response to Comment 76-10.

6 The leak detection system at each pump station was described on page 1-31 of the DES, as part of the supervisory control system. It is also included in Chapter 1 of the FES.

7 Refer to the sections on Aquatic Resources for discussions of hydrostatic testing. Also refer to the Response to Comment 43-2.

8 The FES has been revised to include the information contained in this comment.

9 This table has been renumbered and retitled in the FES. Clallam County has beed added.

10 The appropriate section of the FES has been revised to indicate the availability of beach access and the intensive sport harvest of razor clams in the area north of Grays Harbor.

11 The marine resource maps identify the areas of sport fishery importance.

12 The U.S. Coast Guard will not release data pertaining to ownership of boats. The only available indication of moorage demand is a 264 person waiting list for moorage at The Boat Haven.

13 Refer to the Response to Comment L-6-19.

14 This comment was considered in the revision of the section on Pipeline System Aquatic Resources in Chapter 2. Only spawning requirements were addressed in detail since the greatest impacts would affect spawning habitat.

15 These comments have been incorporated into the revision of the section on Pipeline System Aquatic Resources in Chapter 2.

**L-18 CONT.**

16 The information identified in this comment has been considered and deleted in the revision of the section on The Around Puget Sound route segment alternative in Chapter 9 of the FES.

17 Refer to the Response to Comment 141-24.

18 The Columbia River is discussed in the Aquatic Resources sections of the FES, in the parts which pertain to the Pipeline System.

19 Refer to the Responses to Comments L-6-38 and L-18C-4. Note that the Future Environment section has been deleted from the FES. Potential impacts on commercial shellfish operations are identified in Chapter 3 of the FES.

20 Refer to the Response to Comment L-6-41.

21 Detailed screening design and intake velocities have not been provided to BLM by NTPC. Refer to the Response to Comment 43-2.

22 Refer to the Response to Comment L-18C-4.

23 The table referred to has been deleted from the FES. These comments were considered during the rewriting of the sections on Marine Resources.

24 The section on Port-Recreation in Chapter 3 of the FES has been revised. Current information indicates that relative to salmon fishing, bottom fishing is of minor importance.

25 The text of the section on Port-Economic Conditions in Chapter 3 has been revised. Economic losses to the salmon fishery would probably be small, but cannot be quantified because of the many variables involved. Refer also to the sections on Oil Spill Risk Analyses and Marine Resources in Chapter 3. Potential compensation is discussed in the section on Port-Economic Conditions in Chapter 3.

26 It is not anticipated that reductions would be noticed in the ocean fisheries because of non-project related factors affecting natural population fluctuations, such as low spawning success, reduced survival, and year class dominance.

27 Only a portion of a particular fish population would be likely to be eliminated with the remaining portion having the capability of restoring the population to pre-impact levels. It is doubtful that a particular run would become extinct. Pink salmon could be more noticeably reduced over a longer time than other species.

28 Refer to the Response to Comment L-18F-27. Refer to the Responses to Comments 113C-6 and L-18F-2 concerning mitigation suggestions and stipulations. Refer to the Response to Comment 18-1 concerning overhead stream crossings.

29 Refer to the Response to Comment L-18C-4. Also note that this comment refers to resources which are now included in the discussion of the Around Puget Sound route segment alternative in Chapter 9 of the FES.

30 Refer to the Response to Comment L-18C-4.

31 Refer to the table on anticipated impacts to recreational resources in the section on Pipeline System Recreation in Chapter 3. Also note that potential impacts on Hood Canal are now discussed in the section on the Around Puget Sound route segment alternative in Chapter 9 of the FES.

32 Refer to the introduction to Chapter 4 for the explanation of procedures for handling mitigation measures in this ES.

33 Refer to the Response to Comment L-18C-4.

**L-22**

1 In Chapter 9 of the FES route segment alternatives have only been analyzed as discrete segments. Note that the summary tables have been deleted from the FES.

2 The FES has been revised to reflect the April 15 RARE-II designations.

3 If the NTPC proposal is approved it would receive a right-of-way permit to cross federal lands from the Department of the Interior. The permit would contain stipulations which NTPC would be required to comply with wherever it crossed federal lands, regardless of which agency or department managed those lands. It is anticipated that requirements for cultural resource management would be included among the stipulations of any permit. If the NTPC proposal is approved, BLM would consult with the Forest Service and other federal agencies to develop appropriate stipulations. The administration of the activities covered by the right-of-way permit would be the responsibility of BLM in coordination with other federal agencies.

4 The slope within the developed site would be toward the holding basins. An alternate design for the site has not been considered in the ES, since regardless of how the site is sloped, an overflow and/or breach of the dikes would result in oil reaching the ocean and/or creek. To prevent oil from reaching the creek and/or the ocean in the case of a breach of the dikes would require massive alteration of the topography of Green Point.

5 This has been corrected in the FES.

6 The information contained in this comment has been included in the FES.

7 In such instances a detour route using the road shoulder is often used. However, as indicated in the FES some rural roads might be entirely closed during construction.

L-22
CONT

8 The picture captions have been corrected.

9 This has been corrected in the FES.

10 The sentence referred to has been deleted. It is recognized that the proposed pipeline route parallels the river and the highway for over 15 miles and would cross each 3 times.

11 The sentence referred to has been deleted from the FES. The FES has been revised to be consistent with the Forest Service RARE II FEIS.

12 Existence of controversy in and outside of the Port Angeles area have been discussed in Chapter 2 of the FES.

13 This has been corrected in the FES.

14 The FES has been revised to address current RARE II recommendations.

15 The sections referred to in the comment have been reviewed and it has been determined the information is consistent.

16 The discussion of threatened and endangered species and unique habitats has been revised and clarified in the FES. It is impossible to suggest what the training of the inspector might be.

17 Milepost designations have been corrected and changed to be consistent with NTPC's current proposal.

18 Refer to the Response to Comment L-22-17.

19 Refer to the Response to Comment L-22-17.

20 NTPC's proposed route no longer crosses the Flathead Indian Reservation. Reference to antagonism on the Reservation has been deleted from the FES.

21 The derivation of the assumptions questioned is explained under General Economic Methodology in the section on Pipeline System Economic Conditions in Chapter 3 of the FES. Reference citations have been corrected.

22 Chapter 4 of the FES has been completely revised. The discussion of camping facilities has been deleted. A specific discussion of mitigation measures in a fault zone has not been added. Refer to the introduction to Chapter 4 for an explanation of BLM procedures for handling mitigation measures in this ES.

23 Personal communications with officials of the Columbia Basin Project, Washington, indicate that soil productivity loss has been negligible where hundreds of miles of drainage pipe has been installed over a period of many years. Installation of drain tile or pipe is at similar depths and trench widths as would be experienced on a crude oil pipeline. Personal observations and experience with the Columbia Basin Project indicate that a 5 percent loss in soil productivity would be the maximum.

24 Lands converted to exclusive project use would include land occupied by pump stations and delivery facilities and those forest lands within the corridor where trees would be prohibited.

25 This sentence has been deleted from FES.

26 The life of the project impacts on timber are identified earlier in the section referred to in this comment. The sentence referred to in the comment identifies short term impacts.

27 Chapter 6 has been revised and no longer includes this sentence.

28 The points raised in this comment have been reviewed, analyzed and reflected in text changes in Chapter 7, as appropriate.

29 Appropriate changes have been made in Chapter 3 of the FES since the Jackass Ridge Route has been designated as part of NTPC's proposed route.

30 The table referred to has been deleted from the FES.

31 Refer to the Response to Comment L-22-2.

32 The Visual Resources sections of Chapters 2 and 3 have been revised to include discussions of the Jackass Ridge route segment which is now a portion of NTPC's proposed route.

33 This concern has been considered in revising the section on Pipeline System Topography/Geology in Chapter 3.

34 The assessment in the FES (in Chapter 3) is essentially the same as the assessment of soil impacts on the Siegel-Ninemile route by the Forest Service. Since this segment is now a part of NTPC's proposed route the impact assessment is also included in the Map Addendum of the FES.

35 This concern has been addressed in the revisions of the section on Pipeline System Wildlife in Chapter 3 of the FES.

36 One endangered plant could occur along the Jackass Ridge corridor. The text and table in Chapter 3 of the FES been changed accordingly.

37 The numbers of sites reflects existing data, which may or may not be an accurate representation of the actual numbers of sites in the two areas.

38 The economic impact of the loss of forest land involved was not calculated.

L-22
CONT.

39 This concern has been considered in revising the section on Pipeline System Topography/Geology in Chapter 3.

40 The table referred to in the comment has been deleted from the FES.

41 The table referred to has been deleted from the FES. The position of the Tribal Council is mentioned in the discussion in Chapter 9 of the route segment alternative which would cross the Reservation.

42 This information has been included in the revisions of the section on Pipeline System Wildlife in Chapter 2 of the FES.

43 The table referred to has been deleted from the FES.

44 The table referred to in this comment has been deleted from the FES.

45 Reference for the Northern Tier proposal on National Forest System Lands has been added to the FES.

46 Scrapers would remove solids, mostly wax, from the pipe walls. The material then passes on through the pipe, and no disposal is necessary.

47 Hopefully the incorrect references to maps have been corrected in the narrative.

L-31

1 The Cross-Puget Sound route proposal is discussed and evaluated in Chapters 1 through 7 of the FES, with substantially greater detail than was in the DES.

L-32

1 The section on Pipeline System Transportation and Utilities in Chapter 3 has been revised to include a discussion of these potential impacts.

2 This item number includes all the specific Chapter 1 comments contained in Comment Letter L-32. Refer to the first two paragraphs of the General Response to Comment 126 concerning many of the comments. Refer to the new sections on Oil Spill, Fire and Explosion Risk Analyses in Chapter 3 and to the Response to Comment 126-Water Quality, 2 concerning submarine pipeline spills and leak detection. Refer to the Response to Comment 34-16 concerning other pipeline spills and leak detection systems. The information contained in comments pertaining to Coast Guard activities has been included in Chapter 1 of the FES.

3 Property ownership on Ediz Hook is illustrated on the map entitled "Ownership and Leasing-Port Angeles Area" in the Map Addendum of the FES.

4 The table referred to has been updated and revised.

5 The figures referred to have been revised in the FES.

6 The revised table submitted with this comment has been included in the section on Port-Economic Conditions in Chapter 2 of the FES. The text has been revised to distinguish between traffic west and east of Port Angeles.

7 This concern has been considered in revising the sections on Pipeline System Topography/Geology in Chapters 2 and 3 of the FES.

8 This sentence referred to in the comment refers to ballasting emissions. These emissions are described in greater detail in the following paragraphs in the text. The information on the percentage of ships with segregated ballast was obtained from Tanker Register by H. Clarchson and Co. Ltd.

9 Anchor dragging was discussed as a possibility; however, no analysis has been performed to determine the likelihood of occurrence.

10 The NOAA-PMEL trajectory data has been used in the FES.

11 This comment has been reviewed and it has been determined that the discussion of this issue in the section on Port-Land Use in Chapter 3 is appropriate. More specific information is not available. The purpose of the ES is to identify and evaluate the probable impacts. NTPC has indicated that it would consult with the facility owners to determine a mutually satisfactory relocation site.

12 Chapter 3 of the FES contains new sections on Oil Spill, Fire and Explosion Risk Analyses. Potential impacts of explosion on the Coast Guard Station are mentioned in the section on Port-Land Use in Chapter 3, however, specific mortality estimates have not been included. The statement on oil spills referred to in the comment addresses potential oil spill impacts to adjoining "land" uses, and not impacts on water quality. Such impacts are discussed in the Marine Resources sections of the DES and the FES.

13 The section on Port-Transportation and Utilities in Chapter 3, under Inland Water Transport Operation Phase, has been revised to state that there would be a possible restricted anchorage area over the submarine pipelines instead of a proposed restricted anchorage area. The construction phase of the Inland Water Transport section does state that inconveniences would be experienced during the laying of submarine pipelines. For economic effects of pipeline construction see the section on Port-Economic Conditions in Chapter 3.

14 The section on Port-Transportation and Utilities in Chapter 3 has been revised to indicate the possible construction, operation and abandonment impacts to the U.S. Coast Guard operations on Ediz Hook.

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15 The section on Port-Transportation and Utilities in Chapter 3 has been revised to indicate the possible impacts to the Boeing Company and Pearson Aircraft if the port facilities are constructed.

16 Various statements in Chapters 1 and 4 of the FES have been revised to be consistent with the information in this comment.

17 The table in Chapter 5 is intended to be only a summary of potential impacts. Impacts are also discussed in Chapter 3. The possible effects of fire or explosion on the Coast Guard Station would depend, in part, on the ultimate location of the NTPC facilities and on whatever alterations, if any, would be made of the Coast Guard installation. Considering the existing information, it was determined that more detailed estimates of fire and explosion effects could not be made.

18 The third berth would be constructed only if the proposed pipeline expansion to serve the Puget Sound refineries were required. The potential impacts of the third berth would receive a thorough analysis in an environmental statement which would likely be required prior to construction.

19 The figure has been revised to include this change.

20 A map showing the Strait of Juan de Fuca traffic separation scheme has not been included. However, in Chapter 9 of the FES it has been pointed out that the inbound traffic lane would be about 7,000 feet from the closest mooring for the Freshwater Bay alternative and that the Low Point single point moorage would be located between the inbound Vessel Traffic System traffic lane and the Clallam County shoreline.

21 The Ports and Waterways Safety Act has been referred to in the section on Legal Constraints in Chapter 1 of the FES.

L-45 A

1 The discussions of alternative proposals and their potential impacts have been expanded in Chapters 1 and 8 of the FES.

2 The discussion of the SOHIO proposal for a pipeline from Long Beach, California to Midland, Texas has been changed in the section on Other Crude Oil Transportation Systems in Chapter 9 of the FES.

3 The CEQ regulations cited in this comment do not apply to this ES (see Section 1506.12 (b) of the regulations). However, the ES has presented descriptions of the four major alternative proposals in Chapter 1 and has analyzed their environmental impacts in Chapters 3 and 8. While the various alternatives were examined in the DES, the discussions have been rewritten and expanded in response to comments received and the filing of formal Title V applications by the four companies. Thus, the FES does present a detailed description of the potential impacts of all viable alternatives. In Chapter 8 of the FES there are 4 summary tables which present information about the proposals and their potential impacts in concise form.

In response to requests received from the public to provide a new comment period, the Department of the Interior has announced that it is seeking comments on the FES. Comments received will be used and, where appropriate, incorporated into the decision-making process. Additionally, under Section 505 (c) (2) (B) of Title V of the Public Utility Regulatory Policies Act of 1978 (16 USC 2601 et. seq.), the recommendations of federal and state agencies will be submitted to the public for review and comment. Thus, there will be two additional opportunities for public comment.

4 The visual sensitivity ratings were reviewed and were not changed. Note that the segment referred to in the comment is now part of the Around Puget Sound route segment alternative and is discussed in Chapter 9 of the FES.

5 The text has been corrected in the FES.

6 Black River Swamp, Millersylvania State Park and Weir Prairie have been identified as potential impact areas in the discussion of the Around Puget Sound route segment alternative in Chapter 9 of the FES. The West Bar area has been added. The scabland areas were included in the DES and are in the FES. The Turnbull Pine Research Natural Area is outside the corridor of the proposed pipeline. The Killarney Wildlife Management Area is not being recommended for inclusion in the National Registry of Natural Landmarks.

7 Chapter 3 of the FES has been revised to clarify the apparent contradiction. Chapter 10 of the FES contains a description of the current status of BLM's consultations concerning the proposal for a Memorandum of Agreement.

8 The table on Anticipated Impacts to Recreational Activities in the section on Pipeline System Recreation in Chapter 3 summarizes potential impacts on recreation resources. Site specific details are not included since the ES is a corridor study and the precise centerline of the proposed pipeline is not known. The text of the section referred to above has been revised to indicate that areas developed with L&WCF funds would be subject to constraints which could prohibit their use as pipeline right-of-way. Specific mitigation measures have not been described. Refer to the introduction to Chapter 4 for an explanation of procedures for handling mitigation measures in this ES.

9 Site specific information cannot be provided since this ES presents a corridor study only. The precise centerline of the proposed pipeline is not known. Refer to Chapter 4 of the FES concerning mitigation measures. Refer to the first part of the Response to Comment 107-1 concerning revegetation.

**L-45 CONT**

10 The summary paragraph of the section on Pipeline System Visual Resources in Chapter 3 has been deleted from the FES. The subsection describing operation phase impacts has been revised to include mention of cleared right-of-way segments in forested areas.

11 NTPC has indicated that it would completely revegetate all disturbed areas. Exact methods would vary according to local conditions and requirements of easements and permits. NTPC has also indicated that it would vary according to local conditions and requirements of easements and permits. NTPC has also indicated that it would maintain the right-of-way for the life of the project.

12 The section on Segment 1 under Pipeline System Visual Resources in Chapter 3 has been revised. Refer to the Response to Comment L-45A-11 concerning revegetation. Resources along Hood Canal are discussed in the section on the Around Puget Sound route segment alternative in Chapter 9 of the FES. The emphasis in the discussion has not been changed.

13 The site was listed in Table 2.1.1.10-1 of the DES. In the FES it is identified in Chapter 9, in the section on the Around-Puget Sound Route Segment Alternative.

14 The ratings were reviewed in response to this comment but they were not changed. It was determined that the ratings are consistent with the "modified" system used in the ES, which is explained in the Visual Resources sections of Chapters 2 and 3.

15 The section referred to in the comment has been revised in the FES.

16 The segment referred to is now described as a route segment alternative in Chapter 9. More detailed descriptions have not been provided in FES.

17 The suggestion contained in the comment has been noted. However, permit stipulations would be developed only following an administrative decision to approve a proposed project. BLM cannot commit itself to specific permit stipulations in the ES.

18 BLM recognizes the advantages of shared use of existing rights-of-way. However, more detailed information about the precise location of the proposed NTPC pipeline and about possible joint use of right-of-way is not available for inclusion in the FES.

19 The text of the FES has been corrected.

20 Refer to Chapter 4 of the FES, which does not include the site-specific detail requested in the comment, but which does include an explanation of the way mitigation measures have been handled in this FES.

**B**

1 The information provided in this comment has been reviewed. The section on Pipeline System Recreation in Chapter 3 has been revised to include mention of the L & WCF Act. NTPC has changed its route proposal since publication of the DES. The currently proposed route does not cross the Glacial Lake Missoula National Natural Landmark.

**C**

1 These problems have been recognized. Under the particular circumstances affecting the preparation of the ES on the NTPC and Title V applications, it was determined that preparation of a Memorandum of Agreement as described in Chapter 10 would be an adequate and appropriate way to achieve compliance with section 106 of National Historic Preservations Act of 1966.

2 The statement quoted above is taken from the section of the DES dealing with the future environment which is concerned with potential impacts on resources if the NTPC project is not constructed.

3 Following publication of the revised regulations, 36 CFR 800 on January 30, 1979, BLM inquired about the status of the "Guidelines" and was informed by the Council that they should be followed in their existing form until a revised version is formally published. It was neither feasible nor possible for predictive surveys of each alternative to be conducted during the preparation of the ES for the Northern Tier proposal and the Title V applicants. Therefore, BLM, in consultation with the Council, prepared the proposal for a Memorandum of Agreement which is described in Chapter 4 of the FES.

4 The cultural resources section was mistakenly deleted from the section of the DES describing the Stampede Pass route segment alternative. It has been included in the FES.

5 Specific mention of possible underwater sites being encountered has been added to the FES.

6 The NTPC proposal does not include the construction and use of any temporary work camps. If the project is approved and built, it is anticipated that workers would obtain or provide their own housing.

**L-46**

1A Recent inquiries concerning the Reid Vapor Pressure (RVP) of North Slope crude were made by Science Applications, Inc. A representative from SOHIO indicated an RVP of 3.4 psia. A representative from Chevron quoted an RVP of 3.9 to 4.2. Exxon stated a figure of 3.0 while a representative from EPA quoted a value of about 4.0. Based on these inquiries, the NTPC value of 2.9 was found to be low. The BLM has therefore revised the value of the RVP for Alaskan North Slope crude upward to 4.2.

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However, the true vapor pressure, which is used in the calculation for storage losses from tanks, as dependent on the storage temperature of the crude. It was determined after additional study, that the storage temperatures of 97°F in summer and 80°F in winter which were assumed earlier, were too high. Actual delivery temperatures at unloading ports were found to range from 50°F to 72°F. Consequently, the delivery temperatures were revised downward to 75°F.

With an RVP of 4.2 for Alaskan oil the average RVP for all sources of crude, foreign and Alaskan, is 4.7 psia. With an RVP of 4.7 and a delivery temperature of 75°F, the average annual storage losses are 7 percent lower than the original emissions. Thus the revised assumptions result in little change in emissions.

With respect to the assumption regarding color of the storage tanks in figuring emission rates, it was judged that painting the tanks a metallic green on gray would not substantially change emissions. The climate of the Port Angeles area is such that solar intensity is generally lower than most places in the U.S. and warm summer days are infrequent. It was felt that coloring the storage tanks other than white would not raise storage temperatures of crude oil sufficiently to cause a significant increase in emissions.

1B A worst-case tank farm scenario was used to determine highest hourly hydrocarbon emission rates from the storage tanks. It was assumed that for the 933,000 bpd throughput, the distribution among the 18 tanks would be as follows:

| | | RVP |
|---|---|---|
| 5 tanks | Saharan Blend | 8.9 |
| 5 tanks | Iranian Light | 6.5 |
| 3 tanks | Bonney Light | 6.4 |
| 5 tanks | Alaskan Crude | 4.0 |

The storage temperature was 75°F with a wind speed of 20 mph. The worst case hourly emission rate was calculated to be 156.4 lb/hr.

It must be noted that emissions are wind speed dependent with increase in emissions with increasing wind speed. However, meteorological conditions conducive to high pollution concentrations are associated with light wind speeds. Emissions for modeling purposes would therefore tend to be lower than calculated.

Ballasting emissions were not based on average ballasting capability of the tanker fleet. Rather, the worst-case scenario was assumed where two tankers without segregated ballast tanks are ballasting in port. It was assumed each tanker would ballast up to 20 percent of its dead weight tonnage.

Venting emissions are a potential problem if a tanker has cargo tanks that remain empty after unloading. No venting emissions would occur with ships equipped with inerting systems. Venting emissions can also be avoided if the pressure vent valves on the cargo tanks are set at 1.5 psi (SAI, 1979). However, if venting emissions were to occur they would not be as great as emissions due to ballasting where vapors are forced out of a cargo tank by ballast water. For this reason, the worst-case emission scenario considers a tanker ballasting rather than venting.

For example, according to EPA (1977) venting emissions for a 120,000 DWT tanker is 360 lb/hr. However, if a similar size tanker would allow ballasting of empty cargo tanks up to 20 percent of its dead weight tonnage, the hydrocarbon emissions would be about 2,600 lb/hr.

1C NTPC has presently no plan for generating its own electrical power. The impact analysis in the ES assumes therefore that all power would be purchased from local utilities. The problem of electrical energy is still under investigation by NTPC, but the exact means by which power would be purchased has not yet been determined.

In case electrical power should be unavailable, NTPC could generate its own power using diesel-driven turbine generators. Total electrical demand would be an average load of 20.1 megawatts and a peak load of 31.2 megawatts. Emissions of air pollutants would be considerable, especially emissions of nitrogen oxides. Using EPA's Compilation of Air Pollutant Emission Factors, Third Edition, August 1977, Table 3.3.1-2, the following emission rates were estimated: particulates, 62 tons/yr; sulfur dioxide, 44 tons/yr; nitrogen oxides, 845 tons/yr; hydrocarbons, 70 tons/yr; and carbon monoxide, 192 tons/yr (SAI, personal communication, 1979). These emissions would require a PSD (Prevention of Significant Deterioration) review by EPA, which would include a determination of resulting air quality impacts.

However, since the use of diesel-driven generating equipment is not in the present proposal the ES does not analyze the resulting impacts. If at a later date NTPC decides to generate its own power, a separate air quality study would have to be made.

Similarly, impacts caused by industrial growth could not be addressed in the ES because any assumptions that would have to be made would be highly hypothetical and no meaningful impact analysis would be possible. If industrial expansion occurs in the future, a separate impact analysis would have to be made. Any major new source would be subject to the limitations under the PSD regulations, and would require approval by EPA prior to construction.

1D A 30 percent increase in emissions does not cause a 30 percent increase in visibility impairment. The relative reduction in visual range is dependent on meteorological conditions, scattering properties of particulates, gas to particle conversion rate, and existing visual range.

Using a very simple visibility model, a general assessment of the impact on visual range can be made. The most significant potential impact on

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CONT

visibility would be sulfur dioxide gases converting into sulfate particles. The conversion rate under favorable conditions is about 1 to 2 percent per hour. The sulfur dioxide would have to remain in the area for an extended period in order to have adequate time for a significant amount of sulfate particles to be formed. Thus a stagnation episode, a period with light winds and limited mixing lasting for at least 24 hours, would be most conducive to a significant visibility impairment.

The worst-case sulfur dioxide emission rate would be 344 lb/hour, or about 37 percent of existing emissions in Port Angeles. Particulate emissions would be 92 lb/hour, or about 26 percent of existing emissions. If one assumes these emissions to accumulate in a limited volume of air over a 24-hour period, the reduction in visual range was calculated to be about 6 percent of the existing visual range.

However, under average conditions, pollutants would be transported out of the area at a certain rate and the concentrations of particulates would be smaller. There also would not be sufficient time for a significant amount of sulfates to form in the immediate area. Therefore, visibility impairment would be considerably less, and probably would not be significant.

1E The modeling for Port Angeles was not based on stability or mixing height data for Seattle. Stability was determined from five years of hourly observations taken at a National Weather Service station located on Ediz Hook. Use of a STAR program allows determination of stability from a record of surface observations. Since no mixing height data exist for Port Angeles, modeling was done using a number of different values for the mixing height of 259 meters resulted in the highest ground-level concentrations. Consequently, a mixing height of 250 meters was assumed in all modeling calculations.

2 The photograph referred to in the comment has been deleted from the FES.

3 Refer to the Response to Comment 145-11 and to Chapter 4 concerning mitigation measures.

4 Hourly wind data were available at Port Angeles for a 5-year period, from 1948 through 1952. This data includes all stability categories, stable as well as neutral and unstable. A sufficient data base therefore exists for stable conditions.

In the absence of vertical temperature data for Port Angeles, a worst-case mixing height of 250 meters was assumed in the dispersion modeling. This is the optimum mixing height that would result in highest ground level concentrations based on the maximum effective plume rise for the tankers.

Fumigation was considered in the modeling. A fumigation situation was found to be realistically simulated by using a mixing layer of 250 meters topped by a strong inversion, which was done in the TEM model runs. The TEM modeling results therefore would give results equivalent to that of a fumigation model.

5 The Olympic National Park boundary is shown on the map entitled "Nonattainment Area" and on other maps in the section of Port Angeles maps in the Map Addendum.

6 This error has been corrected in the FES.

6A The caption for the photograph in the section on Air Quality in Chapter 2 has been changed. The photographs in the Draft Summary illustrated existing conditions, with no implications about types of plumes shown.

7 Air quality data for sulfur dioxide, particulates, and ozone are presently being collected in the Olympic National Park by NTPC. The data were not yet available at the time the FES was in preparation.

Modeling data using existing pollutant sources in the Port Angeles area indicate an annual average sulfur dioxide concentration of about 3 $ug/m^3$ at the Park Headquarters and a concentration of less than 1 $ug/m^3$ at the Heart O' The Hills Ranger Station.

8 These errors have been corrected in the FES.

9 The land use map in the section on Port-Land Use in Chapter 2 has been corrected to include the Olympic National Park Heart O' The Hills corridor. The recreational color code for Dungeness Spit has been retained, and it has been labeled a National Wildlife Refuge for further clarification.

10 The correct acreage of the Park has been indicated in the FES.

11 Consideration of groups and individuals opposing and supporting the proposed action is contained in the Social Conditions section of the FES. Chapters 2 and 3 contain specific discussions of these particular interests.

12 The analysis used to calculate expected frequency of PSD violations assumed the full range of emission rates. The scenario of the 80,000 dwt and 190,000 dwt tanker combination was used to determine compliance with the national ambient air quality standards, which are based on once per year occurrences. The worst-case was not used since the probability of having two 327,000 dwt tankers unloading in port simultaneously is only 0.14 per cent (frequency of occurrence of once per 2 years). The probability of worst-case emissions occurring with worst case meteorology is even smaller. A two-berth facility was assumed in the impact analysis. A three-berth facility is not part of NTPC's current proposal.

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CONT.

13 Refer to the Response to Comment 62-1.

14 The existing sulfur dioxide concentration was determined by diffusion modeling for present pollution sources in Port Angeles. The highest calculated annual average sulfur dioxide concentration due to existing sources was 28 ug/m$^3$ and occurs about a mile east-northeast of the ITT Rayonier plant. The calculated annual average sulfur dioxide concentration at the Olympic National Park Headquarters was about 3 ug/m$^3$. The annual average sulfur dioxide concentration was calculated to be less than 1 ug/m$^3$ at the Heart O' The Hills Ranger Station.

Construction activities would be far enough away from the Olympic National Park (at least 3 miles) that there would be no construction phase air quality impacts on Park Service land.

Acid rain is not considered because there is no evidence that the proposed project would cause significant enough sulfur dioxide emissions to cause a change in the pH of rainwater. There are no existing data on the pH of rainwater in the local area. However, there is no evidence of an acid rain problem in western Washington.

The last paragraph in the Summary distinguishes between plume blight and reduction in visual range. Stack plumes from tankers would be visible at times, but they would largely consist of steam. A significant reduction in visual range is not likely, however, since the projected increase in mass of particulates in the atmosphere, which are primarily responsible for visibility reduction, would be relatively small. The average particulate emissions from tankers would be only about 7 per cent of particulate emissions from existing Port Angeles sources. Sulfates, resulting from the oxidation of sulfur dioxide in the atmosphere, also can result in visibility reductions. The project sulfur dioxide emissions would be about 20 per cent of the existing Port Angeles levels. A small percentage of the emissions could convert to sulfate particles. Present reductions of visibility in Port Angeles can almost entirely be attributed to existing industrial sources. It is not likely that the proposed sources would be of sufficient magnitude to cause a significant additional visibility reduction.

Refer to the Response to Comment 126-Tourism/Recreation, 15 concerning the phase "main park boundary".

15 This table has been corrected in the FES.

16 The queuing model was run for the 933,000 bpd as well as the 709,000 bpd throughputs levels. The emission rates in the table on stack emission rates were derived from the queuing model based on 933,000 bpd throughput.

17 It is stated, in the DES and the FES, that Class I increments for sulfur dioxide would be violated within Olympic National Park. The table entitled "Estimated Frequency of Class I Violations for Sulphur Dioxide in Olympic National Park" (in both the DES and FES) includes "percentage of time" values which are not the same for both throughput levels. Note, for example, that both 0.7 % and 0.8% of the time would amount to approximately 3 days per year. The rationale for not using worst-case emissions has been reviewed and it is considered to be appropriate and adequate. Refer to the Response to Comment L-46-14 concerning visibility and to the Response to Comment 126-Tourism/Recreation, 15 concerning the phase "main park boundary".

18 The hydrocarbon standard is to be used only as a guideline for the purpose of achieving the ozone standard. If concentrations exceed the value, it does not necessarily constitute a violation, nor does it necessarily endanger health.

It is not definitely known whether hydrocarbons by themselves constitute a health hazard. Unless a definite determination has been made that there is a health hazard, no impacts can be identified. It is known, however, that hydrocarbons can lead to ozone formation under certain conditions. It was determined that no significant ozone levels would result in the Olympic National Park. In the absence of PSD standards on definite threshold values related to biological effects, there would be no basis for relating hydrocarbon concentrations to impacts on Olympic National Park.

Purging is not a routine operation. If it is done, it is usually performed on the open sea while in route to a dry dock or other maintenance facility.

19 The DES did not state that there is presently no visibility reduction to an observer from within Olympic National Park. The DES did say that project emissions capable of reducing visibility are rather small compared to those from existing sources. A visitor on one of the viewpoints in Olympic National Park would notice a visibility reduction over Port Angeles. However, this would be mostly attributable to existing emissions. It is not likely that there would be a noticeable decrease in visibility after the project would start operation.

Plumes from tankers would be visible at times. However, it is not known whether this would be distracting to visitors.

20 While construction of the submarine pipeline will temporarily interfere with littoral drift off Green Point west of Siebert Creek it is not felt that there will be a significant impact in the geohydraulic conditions that maintain Dungeness Spit. Field investigations conducted by Shannon & Wilson (1978) and examination of aerial photos indicate that most of the sediment for Dungeness Spit is derived from cliffs east of Siebert Creek.

21 The sections on Biological Components of Marine Resources were completely rewritten for the FES. These comments were considered during the rewriting.

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CONT

22 The illustration referred to has been deleted because NTPC's proposal for ascending the Green Point bluff has been changed. NTPC's proposal is for 11 tanks at the initial throughput and 18 tanks at the ultimate throughput level. Additional tanks are not part of NTPC's current proposal. Refer to the introduction to the section on the NTPC proposal in Chapter 1 and to Chapter 6 concerning possible expansion of the proposed NTPC facilities.

23 The statement referred to has been revised in the FES.

24 The FES includes new sections in Oil Spill, Fire and Explosion Risk analyses in Chapter 3. NTPC's current proposal is for two berths only. Refer to Chapter 6 concerning the third berth.

25 The section on Port-Recreation in Chapter 3 has been revised in response to this comment.

26 The text of the section on Port-Economic Conditions in Chapter 3 has been revised to discuss the potential for petroleum-based industry more thoroughly.

27 Mitigating measures which NTPC has committed itself to were listed in Chapter 1 of the DES. No additional, committed, mitigating measures could be identified. Therefore, impacts in Chapter 5 were the same as those identified in Chapter 3. Refer to Chapter 4 of the FES for an explanation of how mitigation measures have been handled.

28 Specific mitigation measures such as these have not been added. Refer to Chapter 4 of the FES for an explanation.

29 It was not assumed that NTPC's proposed project would be approved if air quality violations would occur. The purpose of the ES is to identify impacts that would result if the proposal would be implemented. The ES is a decision-making document, which is used as a basis for approving or disapproving a project.

30 Refer to the Response to Comment L-46-21.

31 The impacts of the third berth and associated structures were not detailed because those facilities are not part of NTPC's proposal. Any changes to NTPC's system, which would result in significant impacts which have not been discussed in this FES would likely require a separate environmental statement.

32 The section of Chapter 6 referred to in the comment has been revised to clarify this concern. Impacts on the Olympic National Park are addressed elsewhere in this section.

33 In the preparation of Chapter 7, an attempt has been made to be consistent with the BLM manual for ES preparation, which includes these definitions:
Irreversible - incapable of being reversed; once initiated, use would continue
Irretrievable - essentially irrecoverable; not reasonably retrievable; once used, not readily replaceable

The levels of air quality degradation may affect visitor enjoyment of the Olympic National Park, but would not be expected to affect "important gene pool resources."

34 The purpose of the proposed action has been stated in Chapters 1 and 9 of the FES. Alternative proposals to NTPC have been treated in substantially greater detail in Chapters 1 and 8 of the FES.

35 Air quality impacts of the Port-Pipeline Alternatives were not analyzed quantitatively because of lack of information regarding details of the proposal and lack of environmental data. However, the NEC and TMC proposals have been analyzed in greater detail in the FES.

36 There is no comparison of alternatives specifically in terms of their use of existing corridors. If a company proposes to follow existing corridors along some portions of its route, or if a route segment alternative would follow an existing corridor it is noted in the description. Essential features of the systems proposed by the 4 Title V applicants are presented in a table in Chapter 8 of the FES.

37 The map referred to has a scale of 1:7,500,000 and is designed to provide general locational information only. Specific resource areas are indicated on other larger scale maps where appropriate.

38 The Olympic National Park is shown on the "Land Use of Port Angeles Area" map in the section on Port-Land Use in Chapter 2.

39 The correct location of the park headquarters is shown in the FES. Only one shade has been used for Port Angeles in the maps in the FES.

40 The models used assure a uniform steady-state wind field. There is little reason to believe that a wind field which would cause the plume to intercept the highway at all times would be any more realistic situation than a straight line approach. Even if a curved trajectory were assumed it would not lead to any higher concentrations. In fact, concentrations at the Heart O' The Hills Ranger Station would tend to be lower, since the longer trajectory would allow more time for dispersion.

41 The page referred to in the comment was in the Marine Resources section. The Olympic National Park has been included on appropriate maps.

42 The only potential impacts to the visual resources of the Olympic National Park would be from the affects of reduced visibility for viewers at the Park looking north. Potential impacts on visibility are discussed in the sections on Air Quality in Chapter 3. Potential air quality impacts are indicated on the National Resources Alignment Sheets in the Map Addendum.

43 The FES includes a statement that there would be potential visibility impairment in the Port Angeles area and Olympic National Park.

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44 The items mentioned in Comment L-46-44 all refer to a Technical Document prepared by a BLM contractor. The Technical Document is not part of the DES or the FES; therefore, these items are not responded to here.

45 The proposed Pacific Northwest Trail is mentioned only in the Future Environment section of Chapter 2, since it is still under study and is not yet an existing recreation resource. The Wild and Scenic portion of the St. Joe River is upstream from the proposed pipeline crossing. The table on "Recreation Areas with Protective Legal Status" in the section on Pipeline System Recreation in Chapter 3 has been revised to indicate the current status of the Continental Divide and Lewis and Clark Trails.

46 The section of Chapter 8 on the NEC proposal includes discussions of potential impacts on Glacier Bay and the general area around Skagway. Issues raised include tanker traffic separators, use of ship pilots, improved navigation aids, and oil, fire, and explosion risks. Oil spill trajectories are shown for spills at Hump Island and Hanus Reef, both of which would affect Icy Strait. Discussions of general impacts on resources, recreation, and tourism would apply to the areas administered by NPS. Chapter 9 of the ES includes a discussion of using the Skagway-Carcross highway as an alternative pipeline route. This alternative route would eliminate most of the potential impacts to the Klondike National Historic Park.

**L-54**

1 The section on Projected Demand and Supply in the Introduction to the FES has been revised. The findings of the Draft Report by the Department of Energy (1979) have been incorporated into the appropriate sections of the FES. Refer to the Response to Comment 162-7 concerning NTPC's application to the State of Minnesota for a Certificate of Need.

2 Updated cost and tariff estimates are included in the section on the NTPC proposal of Chapter 1 of the FES.

3 The FES presents the NTPC project with the currently proposed route alignment. The FES contains updated information on oil spill risk and trajectory analyses. The proposals from all four Title V applicants are described in Chapter 1 of the FES. Chapter 8 of the FES contains substantially expanded discussions of the proposals from NEC, TMC and KPL. Refer to the Response to Comment 79-1 concerning the decisions not to prepare a revised DES.

4 The draft report by the Department of Energy (1979) considered the physical supply deficiencies in the northern tier states but did not take into account the amounts which might be supplied under competitive conditions. The Department of Energy has been requested to consider delivery volumes under competitive conditions. The results of their analysis were not available for incorporation into the analyses and discussions in the FES.

5 The Corps of Engineers Beach Erosion Control Project at Ediz Hook is mentioned in the section on Interrelationships in Chapter 1 of the FES. The discussion of potential impacts to recreationists at Ediz Hook has been expanded in the section on Port-Recreation in Chapter 3. Potential air quality impacts are discussed in the sections on Air Quality in Chapter 3. The potential effects of vehicle traffic in Ediz Hook are discussed in the section on Transportation and Utilities. Chapter 3 of the FES contains new sections on Oil Spill, Fire and Explosion Risk Analyses. The specific mitigation measures suggested in the comment have not been added - refer to Chapter 4 for a general discussion of mitigation.

6 The arrangement of sections on Topography/Geology and Soils remains the same in the FES. The revised project description in Chapter 1, and the impact analysis in the section on Topography/Geology in Chapter 3 indicate that additional geotechnical studies would be required before construction could take place.

7 NTPC has now proposed to tanker bunker fuel to Port Angeles. The bunker fuel would be stored in a moored barge near the crude oil tanker berths. Hence, barge spill risk analysis is no longer applicable to the NTPC proposal.

8 Refer to the Response to Comment 145-3.

9 This item number includes all the specific Chapter 1 comments contained in Comment Letter L-54. Refer to the first two paragraphs of the General Response to Comment 126 concerning many of the comments. The information contained in the comments pertaining to Corps of Engineers Activities has been incorporated into revisions of Chapter 1. Errors and inconsistencies pointed out in these comments have been corrected. The general description of the NTPC's oil spill contingency plan has been deleted from the FES, since the plan is only in draft form. Note that the plan would have to be reviewed and approved before operations could begin.

10 The comments have been considered in the revision of the sections on Topography/Geology in Chapter 2.

11 The text references to the map section have been corrected and the report by Shannon and Wilson has been included in the appropriate places in the Reference section of the FES. The relative stability of Green Point relates to its resistance to landsliding, which has not yet been determined. Based on 98 years of historical records the bluff at Green Point has eroded at the rate of approximately 3" per year. This rate is considered to be of minor significance. The degree of stress that the pipe would be able to withstand would be determined during final design studies, after detailed surveys and geotechnical studies are completed.

12 This issue has been considered in revision of the section on Port-Topography/Geology in Chapter 2 and the table on the Richter Scale.

**L:54 CONT.**

13 Only potentially impacted resources are discussed in Chapter 2. No impact to aquatic resources would occur from construction, operation, or abandonment of NTPC's proposal on Ediz Hook. Therefore, no discussion is necessary. The "dark blobs" are the shallow ground water locations, which are adequately explained in the text and the figure.

14 The issues addressed in this comment have been considered in the revision of the section on Pipeline System Topography/Geology in Chapter 2.

15 NTPC has indicated that the pipeline route would be surveyed to avoid coal deposits which are minable with present technology, - i.e., Known Recoverable Coal Resource Areas. Other coal bearing lands in Montana and North Dakota cannot be effectively avoided. However, considering that Montana and North Dakota contain several billion tons of coal, the amount of coal removed from production as a result of this project would be very small, and the impacts minor.

16 While it is realized that soils and geology are closely related, the primary purpose of the soils sections is to deal with agronomic impacts such as soil erosion, compaction, profile disturbance, and subsequent loss of production. These things are very important to the landowners and others, if not important to engineers. The text on soils is only intended to supplement the soil maps and key to soil characteristics in the Map Addendum and is not intended to give a complete description of 1500 miles of soils and 137 mapping units.

17 The Yakima and Columbia Rivers have been included in the table on characteristics of streams in the Columbia Basin. The table referred to in this comment covers streams in the Puget Sound Basin. The information on streams in the ES is based on data supplied to BLM by NTPC.

18 Methodology and impacts, including cumulative impacts of multiple crossings of streams, are addressed in the section on Pipeline System Aquatic Resources in Chapter 3.

19 The level of detail reflects the level of information supplied by NTPC.

20 The table referred to has been deleted from the FES.

21 NTPC's proposed pipeline has not been construed to be a normal action serving a localized area. However, it is the local zoning ordinances and not the magnitude of the project that is the determining factor concerning the location of the proposed corridor. Land use impacts for all phases of the proposal, construction, operation, and abandonment, are discussed in Chapter 3.

22 The proposed BLM and Forest Service wilderness areas are discussed in the sections on Pipeline System Land Use in Chapters 2 and 3 of the FES.

23 This concern has been considered in the revision of the section on Port-Topography/Geology in the Future Environment section of Chapter 2.

24 No tests have been conducted to determine the degree of changes that could occur to the geologic material at Green Point. Consequently no quantification tests are conducted. NTPC has indicated that detailed geotechnic studies would be carried out if its proposal is approved and implemented.

25 Potential oil spill impacts on Port Angeles harbor facilities are discussed in the Port sections on Land Use, Transportation and Utilities and Economic Conditions in Chapter 3 of the FES. The Port Angeles public water supply sources and facilities are all located south and west of the proposed oil port facility pipeline system and would not be affected by any potential oil spill.

26 Estuarine components have been added by NOAA-PMEL to their trajectory model and the final results submitted are included in the FES. NOAA-PMEL in ERL-399-PMEL-29 conceeds that little is known of nearshore processes; therefore, net littoral motion is not discussed. However, from the geomorphology of Ediz Hook and Dungeness Spit, it would appear that the net beach motion is to the east. Re-launching is mentioned, but not discussed in detail.

27 The Marine Mammal Protection Act of 1972 (16 USC 1361-1407) establishes national policy for the protection and conservation of marine mammals, commensurate with sound resource management. The MMPA primarily focuses on aspects relating to "taking" of marine mammals. The ES does consider the effects of oil spills on marine mammals and the impacts from development of the port facilities at Port Angeles (see the section on Port-Marine Resources in Chapter 3).

28 BLM is not aware of any refineries being constructed to use crude oil from the proposed NTPC pipeline. The Port Angeles comprehensive plan is discussed in the sections on Port-Land Use in Chapters 2 and 3 of the FES.

29 Chapter 3 of the FES contains new sections dealing with Oil Spill, Fire and Explosion Risk Analyses. Potential impacts from explosions are discussed in general terms only, not in terms of differing potential impacts from specific potential explosions.

30 It was determined that more detailed analysis of harbor traffic patterns was not necessary for an adequate assessment of potential impacts.

31 The section on Port-Recreation in Chapter 3 has been revised to address the issue raised in this comment.

32 The text references to the Map Addendum have been corrected.

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33 Unless the pipeline were ruptured as a result of outburst flooding, impacts would be minimal. Since the FES presents a study of a 2-mile wide corridor, the precise location of an oil spill and projected movement of spilled oil cannot be determined. The volume of oil released would depend upon distance between block and/or check valves and the extent of damage to the pipeline.

34 Some settling would occur and cause low spots. NTPC is committed to compact backfill material in the trench to prevent slumping or settling. Landowners would be responsible for their own written agreements with NTPC concerning possible compensation for future settling along the pipe trench.

35 Hydrostatic test water would have to meet certain water quality criteria prior to discharge. The criteria would be identified in NPDES permits from the Environmental Protection Agency. NTPC has committed itself to maintenance of the right-of-way for the life of the project. Specific maintenance requirements would have to be determined on a case by case basis. Potential oil spill volumes into streams are identified in the section on Pipeline System Aquatic Resources in Chapter 3. Refer also to the Response to Comment 34-16 for a discussion of leak detection systems and possible spill volumes.

36 No specific mitigation measures concerning water supplies and irrigation have been proposed. Refer to Chapter 4 for an explanation of mitigation measures.

37 Since corrosion inhibitors have not been identified specifically by NTPC, the potential impacts resulting from their release into streams cannot, be determined.

38 Potential impacts of small pipeline leaks on streams have been discussed in general terms in the section on Pipeline System Aquatic Resources in Chapter 3. Refer to the Response to Comment 34-16 for a more detailed discussion of leak detection systems and detectable volumes. No methods in addition to automatic and visual detection, for alleviating the problem have been identified by NTPC.

39 Whooping cranes are mentioned in the Terrestrial Wildlife sections of the FES. The comments on vegetation were considered when the sections on Terrestrial Vegetation in Chapter 3 were revised for the FES. The statement about an environmental inspector identifying endangered or threatened plant species has been deleted from the FES.

40 Round Lake and Heyburn State Park are upstream from the proposed corridor, and impacts should be very minimal to osprey at Round Lake and to wildlife at Heyburn State Park. Noise and disturbance would affect the area primarily during the construction phase.

41 Refer to Chapter 4 concerning mitigation. Potential impacts on national forests and farmland are discussed in the section on Pipeline System Land Use in Chapter 3.

42 The acreages shown include acreage estimates for construction of access roads, electrical lines, and pump stations. No specific mitigation measures for the recovery of losses from damages to soil from oil spills have been identified.

43 The sections of the FES pertaining to impacts to potential wilderness areas has been completely rewritten to include the results of the Forest Service RARE II study and BLM Wilderness Inventory.

44 Revegetation efforts proposed by NTPC are discussed in Chapters 1 and 4.

45 The reason for the difference is that the frequency of an oil spill is based upon the probability of an oil spill in a year per number of pipeline miles affected. For example, since the proposed pipeline would cross twice as much agricultural land as forest land, the spill frequency prediction for agricultural land (one spill in 0.8 years) would be twice that for forest land (one spill in 1.6 years).

46 NTPC, by itself, does not have the right of eminent domain. The use of eminent domain is regulated by state government. Each state involved could grant NTPC, as a common carrier, the right to use eminent domain to acquire easements that could not be negotiated between NTPC and a land owner. NTPC's access to state lands would be regulated by the various state permitting processes.

47 Easements might be required for electrical lines from existing utility lines to the proposed pump station locations. NTPC has stated that pump stations would be located as close to existing transportation and utility corridors as possible, in order to minimize the need for new electrical line corridors. At this time, it does not seem likely that an ES would be required for such utility easements.

48 It would be anticipated that utilities would charge a fee (or include the cost in service rates) to cover the costs for near line construction. Other potential future users would include residential, commercial, and industrial customers. If there would be no need for the power formerly utilized by NTPC, power companies could either reduce power generation or attempt to sell the excess power supply to other utility companies that have a power supply deficit.

49 Chapter 4 has been revised in the FES. BLM procedures for handling mitigation measures in this ES are explained in the introduction to Chapter 4.

50 This comment has been considered in revision of the sections on Port-Topography/Geology in Chapters 2 and 5.

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CONT

51 Potential impacts on Fishery Resources are addressed in detail in the sections on Aquatic Resources in Chapter 3. Refer to Chapter 4 concerning mitigation.

52 Refer to Chapter 4 of the FES concerning mitigation measures.

53 The corridor and its service roads would provide additional access to many undeveloped areas along the pipeline route. However, there are no large tracts of undeveloped land which currently are not accessable.

54 Exchanges of crude oil with Japan has been considered in the section on Other Alternatives in Chapter 9 of the FES.

55 Transportation costs for ANS crude from Valdez to Chicago would amount to $1.93 per barrel via the Northern Tier system (63¢, tanker; $1.30, pipeline) versus $3.41 per barrel via the Panama Canal (DOE, 1979). Cost information, including operating costs, is presented in the statement to the extent available. Comparative cost analyses including all costs associated with each transportation system, and a benefit-cost analysis will be presented in the final DOE report.

56 Coal, solar energy and synthetic crude are discussed in the section on Other Alternatives in Chapter 9 of the FES.

57 The SOHIO pipeline and Panamanian Transhipment were addressed as alternatives since they could meet part of the purpose of the systems proposed by the Title V applicants, that is, reducing the surplus of crude oil in excess of west coast refinery needs. The present status of the SOHIO and Panamanian Transshipment projects has been indicated in Chapter 9 of the FES.

58 Reduced Alaskan oil flow is considered in the section on Other Alternatives in Chapter 9 of the FES.

59 Revised trajectories appear in the FES. Refer to Stewart (1978) for discussion of the trajectory model.

60 NTPC proposes to tranship about 53 percent Alaskan crude oil and 47 percent foreign oil. Other systems and alternatives have been discussed in Chapter 9 of the FES.

61 This information appears in Chapter 10 of the FES, where appropriate corrections have been made.

62 The table with the Modified Mercalli Intensity Scale has been deleted from Chapter 2 of the FES. The Mercalli Scale is described in the Glossary of the FES. The map showing "Seismicity and Seismic Risk" in the Map Addendum indicates a huge area with a dashed line as the probable area in which the epicenter of the 1872 earthquake was located. The small circle inside that area denotes another earthquake of Richter Magnitude M4 to M5.

63 The "Geology and Tectonics" map is only intended to be a general location map. Potential critical and significant impacts from geologic hazards are indicated on the Natural Resources Alignment Sheets in another section of the Map Addendum.

64 This map is intended as a quick reference for reviewers with expertise in soil science. The key to soil associations, also in the Map Addendum, is intended to be understandable by reviewers in general. Soil surveys are made primarily for agronomic interpretations. Soil depths below plant root zones become less pertinent to agriculturists and more pertinent to engineers.

65 In the FES a legend has been added to identify the areas shown in the map of "Residential Neighborhoods."

66 This correction has been made in the FES.

67 The designation and numbering system for major river crossings have been revised in the FES. Whenever a river name of an affected river has not appeared on an alignment map, the name is provided in the notes on the facing page.

68 Refer to the Responses to Comments L-54-63 and L-54-64.

69 Available information and personal observations of soils in these areas indicate that they are highly subject to erosion when ground surfaces lack protection from vegetation or mulches. Losses of a valuable, nonrenewable resource such as topsoil in amounts up to 70 tons per acre, annually would be critical.

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| L-18 | Assistant Secretary for Science & Technology, D.C. |
| *L-18A | Maritime Administration, D.C. |
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| 30 | State Planning Division, Bismarck, ND |
| * 30A | State Soil & Conservation Commission, Bismarck, ND |

* COMMENT LETTERS WHICH HAVE RECEIVED SPECIFIC RESPONSES ARE INDICATED WITH AN ASTERISK.

*L-32 U.S. Dept. of Transportation, Office of the Secretary, D.C.

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* 15D University of North Dakota, Dept. of Geology, Grand Forks, ND

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- 178 Skagway Chamber of Commerce

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# GLOSSARY & REFERENCES

# GLOSSARY

agricultural lands - includes pasturelands and croplands

alluvium - clay, silt, sand, gravel, or similar detrital material deposited by running water

ambient - surrouding atmospheric conditions

angle of repose - maximum angle of slope measured from a horizontal plane at which loose, noncohesive material will come to rest on a pile of similar material; commonly ranges between 33° and 37° on natural slopes

anode - the positive electrode of a cathodic protection system, which inhibits external corrosion on buried structures such as pipelines. The anode is buried and located to distribute electric current through the soil and into the structure being protected. Oxidation and corrosion occur at the anode

ANS - Alaska North Slope

ANSI - American National Standards Institute

API - American Petroleum Institute

API gravity - gravity scale used in the petroleum industry to make accurate comparisons of gravities of petroleum products easier. API gravity is expressed in degrees and is related to specific gravity, as:

$$\text{Degrees API} = \frac{141.5}{\text{specific gravity }60°\text{F}/60°\text{F}} - 131.5$$

aquifer - water-bearing stratum of permeable rock, sand, or gravel

archaeological resources - all physical evidence of past human activity, other than historical documents, which can be used to reconstruct ways of life and cultural history of past peoples. Archaeological resources may pertain to prehistoric or historic human activity. These resources include sites, artifacts, works of art, environmental data, all other relevant information and the contexts in which it occurs

ballasting - process of taking on ballast, usually seawater, in a tanker after unloading cargo so that the ship remains controllable and stable

barrel - unit volume measure for crude oil and liquid products equal to 42 U.S. gallons

basic industry - an industry primarily serving markets outside the area or otherwise deriving its primary income from outside the area; distinguished from a nonbasic, or residentiary, industry which primarily serves the local area

bathymetry - measurement of depths of water in oceans, seas, lakes

bearing soils or sediments - soils or sediments which directly support structural loads

block valve - one which can be closed to isolate one section of pipe from the adjacent section

bollard - a post of wood or metal on a wharf around which mooring lines are fastened

bpd - barrels per day, a unit of flow rate

bph - barrels per hour

breasting - berthing as applied to a ship

bryophyte - nonflowering plants comprising mosses and liverworts

BTU - British Thermal Unit, a unit of energy; quantity of heat required to raise the temperature of one pound of water 1 degree F. at or near 39.2 degrees F.

bunker fuel - fuel oil used for ship's engines

bunkering - to fill a ship's own fuel-storage areas with coal or oil

cathodic protection - a method of preventing corrosion by application of an external source of DC voltage that makes underground material to be protected (pipeline, cable, etc.) lower in potential than the surrounding soil. The buried metal becomes a cathode instead of an anode. In practice all usual forms of corrosion are prevented when cathodic protection makes the pipe or other metallic structure 0.25 to 0.30 volts negative to the soil or liquid surrounding it

centrifugal pump - pump made with blades or impellers housed in a close-fitting case. Liquid is pushed forward by the impellers as they rotate at high speed, enabling large volumes of liquid to be transported

check valve - one with a free-swinging tongue or clapper that permits liquid to flow in one direction only

chiseling - the breaking or shattering of compact soil or subsoil layers by use of a tillage implement with one or more cultivator-type feet to which are attached strong knifelike units called chisels

clamshell trenching - a trenching method in which a clamshell grab or drop bucket with hinged jaws is used

conductance - readiness with which a substance transmits light, heat, sound, or electricity

common carrier pipeline - a pipeline having State or Federal authority to provide public transportation services

copepod - minute freshwater or marine crustaceans

coulee - in northwest United States, a dry or intermittent stream valley, gulch, or wash of considerable extent; especially a long, steep-walled, trench-like gorge or valley which is an abandoned overflow channel that once carried meltwater from an ice sheet critical - relating to a situation in which some quality, property, or phenomenon undergoes a definite change

crustacea - hard-shelled freshwater or marine animals including lobsters, shrimp, crabs, barnacles, and copepods

cultural resources - remains of human activity; cultural resources are objects, ruins, works of art, modifications of natural features, archaeological sites, and historic structures valued for architectural merit. Cultural resources may include physical remains; areas where significant human events occurred even though evidence of the events no longer remains; and the environment surrounding the resource. Paleontological resources are also included

cutter suction dredge - a barge-mounted dredge used in river and marine operations up to a depth of 65 feet. An axial rotation cutting/suction device is mounted at the intake of the suction line. The suction line and cutting head are mounted on a pivoting boom carried on a barge which supplies power and transfers the spoil to a discharge line.

decibel - a unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average threshold of pain

diffusion model - a mathematical model which estimates dilution of an air pollutant as it is carried downwind

dispersion potential - a measure of the ability of the atmosphere to disperse pollutant emissions through mixing with surrounding cleaner air

draft - distance in feet and inches from the bottom of a ship's keel to the waterline; depth of a ship in water

dragline trenching - a method of trenching which uses a grab or drop bucket that is dragged along a river- or sea-bottom and is lifted out in a scooping fashion

dwt - deadweight tons; the total weight capacity of a ship expressed in long tons (2,240 lbs); the displacement of a fully loaded ship, less the weight of the ship itself

emission - release of a substance into the atmosphere or water that has the potential to degrade air or water quality

epicenter - the point on the earth's surface directly above the focus of an earthquake

erg - energy expended when a force of one dyne acts through distance of one centimeter. 13.57 ergs = 1 foot/pound; 36 trillion ergs - 1 kilowatt hour

escarpment - a long cliff or steep slope separating two comparatively level or gently sloping surfaces; results from erosion or faulting

fixed berth - a stationary structure at which a ship is moored during loading and unloading operations

final demand, change in - an initial change in regional economic activity coming from an outside source

floating roof - a roof that rests on the surface of the oil contained in a tank rather than on a structural member. The roof raises and lowers with the level of liquid in the tank

forest land/woodland - areas in which tree crowns dominate or obscure most of the land surface

fugitive dust - particulates released into the air from sources other than stacks, commonly from roadways or disturbed soil

GPM - gallons per minute, a unit of flow rate

gross output - gross income of all industries in an economy excepting the cost of goods sold by trade establishments

gross output multiplier - factor used to calculate increase in gross output resulting from an initial change

ground acceleration - the acceleration of an earth particle, measured as a fractional multiple of gravitational acceleration (g), when g = 980 cm/sec/sec (32.15 ft/sec/sec); for instance, 0.1 g = 3.215 ft/sec/sec (98 cm/sec/sec)

grout - thin mortar used for filling spaces into which conventional concrete cannot be poured

historical resources - all evidence of human activity that dates from historic periods directly recorded in writing or photographs. Historical resources include documents (written records, archival material, photographs, maps, etc.), sites, structures, artifacts, environmental data and all other relevant information. Also included are locations where documented historical events took place, even though no physical evidence of the events remains. Historical resources are cultural resources and may also be archaeological resources

homocline - a series of beds of rock all of which have a similar dip and strike

hoteling - a ship at anchor or at berth, consuming fuel only for generating electrical power

hummocky - terrain consisting of rolling, glacial hills

HVAC - High Voltage Alternating Current

HVDC - High Voltage Direct Current

hydrocarbons - compounds principally composed of carbon and hydrogen; they occur in petroleum, natural gas, coal, and bitumens

hydrostatic testing - filling a pipeline or tank with water under pressure to test for tensile strength; its ability to hold pressure without rupturing induced income - income generated by an initial expenditure through the expenditures of the recipient at each successive state of economic turnover

inert gas system or inerting - the process of reducing the oxygen level in an oil tanker's cargo compartments to prevent corrosion and explosion by the introduction of inert gas into a cargo compartment containing liquid to replace the void created by the discharge of the liquid cargo. The gas used is usually flue gas from the ship's boilers washed clean of sulfur and other corrosive substances. (Note: In practice this term is not in general use)

infrastructure - network of services and facilities necessary to support the social system of a community

inland states - those states in the United States other than the northern tier states and the states of California, Alaska, and Hawaii

Known Recoverable Coal Resource Area (KRCRA) - A U.S. Geological Survey designation for federally owned coal deposits determined to be eligible for leasing under the Mineral Leasing Act of 1920 (41 stat. 437)

level of service - a qualitative term applied to streets, roads, or highways; determined and measured by a number of factors including speed, travel time, traffic interruptions, freedom to manuever, safety, driving comfort, and convenience and operating costs

lightering - using boats or barges to off-load or load (e.g. crude oil) ships not lying at wharves

liquefaction - the sudden large decrease of the shearing resistance of a non-cohesive soil caused by a collapse of the structure from shock or strain and associated with a sudden but temporary increase of the pore fluid pressure; involves a temporary transformation of the material into a fluid mass

loessic soils - soils derived from loess, or material transported and deposited by winds; consists predominantly of silt-sized particles

looping (pipeline) - placing additional pipeline sections parallel to an existing mainline to increase overall system capacity

mean lower low water (MLLW) - the average height measured over a 19-year period of the lower of the two low tides occurring during a tidal day

meander loop - an advanced stage of stream meander migration in which stream bends at greater than a 90 degree angle. Meander loops usually develop into oxbow lakes

micromhos - a unit of electrical conductance equal to the reciprocal of 1 million ohms

mill coating - protective coating applied to a pipe at the steel mill

mimic panel - a panel containing a diagram of the pipeline system and connected facilities including tanks, pump units, and valves. The panel is usually provided with operating controls and indicator lights showing the status (off or on, open or closed, etc.) of the equipment

mixing height - height of the layer of the atmosphere near the ground in which mixing takes place

modified Mercalli scale - an earthquake scale that measures intensity as determined by the effects of the release of elastic energy on man and man-made objects at any one locality. (One earthquake can have more than one intensity.) The scale ranges from I (detectable by sensitive instruments) to XII (near total destruction)

mooring hawsers - large ropes for tying up a ship

moraine - a mound or hill composed of unsorted, unstratified rock debris deposited by a glacier

neap tide - a tide of minimum range occurring at first and third quarters of the moon

NEPA - National Environmental Policy Act of 1969

noise - any sound that is undesired or interferes with normal human activity

northern tier states - as defined by P.L. 94-586: Washington, Oregon, Idaho, Montana, North Dakota, Minnesota, Michigan, Wisconsin, Illinois, Indiana, and Ohio

NPDES - National Pollutant Discharge Elimination System

outburst flooding - sudden surge of a large volume of water, as from a dam bursting

overstory - trees whose leaves compose the top of the forest

oxbow lake - lake formed by the diversion of a stream from existing meander

PAD District (PADD) - Petroleum Administration for Defense District; one of five geographic areas of the U.S. used for petroleum administration (see figure 1.1)

paleontological resources - fossils and other evidence which provide information about evolutionary trends among organisms, development of biological communities, and interrelationships between botanical and zoological biota. These resources include fossilized bones, teeth, and tusks; shells, parts of plants including tree trunks or branches, leaves, stems, seeds, and pollen, and non-biological evidence contained in the rocks or sediments surrounding fossils which provide information about the environments in which the organisms lived and in which their remains were preserved

passerine - true songbirds with specialized vocal apparatus which hatch in a very immature and helpless condition requiring care for some time

perched aquifer - a small zone of water located above and separate from the water table

percolation - movement of a liquid (oil, water) through a porous medium (soil, substrata) physiographic province - a region characterized by a particular assemblage of landforms, climate, and geomorphic history

pinniped - aquatic carnivorous mammal (as a seal or walrus) having all four limbs modified into flippers

potholes - sizeable, rounded, and often water-filled depressions in land

prime mover - any means of power, as electric motors or turbines

products pipeline - a pipeline that carries refined petroleum products such as gasoline or jet fuel

prover - a device consisting of a section of pipe or a tank of known volume used for calibrating liquid flow meters

psi - pounds per square inch

psig - pounds per square inch gauge (as observed on a gauge)

purging - displacing the hydrocarbon gas mixture from an oil cargo tank to reduce the gas concentration to below the explosive mixture level by blowing air or inert gas into the tank. The displaced gas is released into the atmosphere. See inert gas system

PURPA - Public Utility Regulatory Policies Act (P.L. 94-617)

quad - quadrillion BTUs ($10^{15}$ BTUs), usually expressed as a rate per year (approximately equal to 472,400 barrels of petroleum energy)

radiographic inspection - inspection of welds by means of X-ray or gamma ray photography

rangeland - areas of uncultivated grassland and shrubland

relief (surge) tank - a tank that receives quantities of oil from a pipelines through a relief valve which limits pipeline pressures to safe values

relief valve - a valve that opens when pressure on a pipeline reaches a predetermined level

restricted anchorage area - an area, indicated on navigation charts, in which the anchoring of ships is prohibited

Richter scale - a logarithmic scale for expressing the magnitude of an earthquake in terms of the energy dissipated, with 1.5 indicating the smallest earthquake that can be felt, 4.5 an earthquake causing slight damage, and 8.5 a very devastating earthquake. The scale has no upper limit, but the strength of earth materials produces an upper limit of about 9.0

scraper - a cylindrical, plug-like device equipped with blades, brushes, and/or rollers used to clean wax and other foreign matter from pipelines. The scraper is inserted in the line at a launching "trap" and is pushed along by the pressure of the moving oil

scree - also called "talus;" loose rock fragments mantling a mountain slope or hill

segregated ballast - ballast contained in ship compartments designed only for that use, as opposed to pumping ballast (seawater) into empty cargo tanks

segregation (batch) - a quantity of oil having a single set of characteristics

seismic risk zone - an area in which the maximum expected damage from an earthquake is the same. The system is based largely on the maximum damage experienced during past earthquakes, regardless of their frequency. Consequently, two regions that have experienced similar levels of damage but widely divergent frequency of earthquakes would be in the same zone. As shown on the Seismicity Map (Map Addendum), there are four seismic risk zones: A) 0 - No damage expected; B) 1 - minor damage expected, corresponding to a Modified Mercalli Intensity V to VI; C) 2 - moderate damage expected, corresponding to a Modified Mercalli Intensity VII; D) 3 - major damage expected, corresponding to a Modified Mercalli Intensity VIII or greater

series, soils - a group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile

shear resistance - in fluid dynamics, a tangential stress caused by fluid viscosity; takes place along a boundary of flow in the tangential direction of local motion

significant - relating to a situation in which some quality, property, or phenomenon is influenced or affected

single point mooring - see SPM

soil association - a landscape that has a distinctive proportional pattern of soils; normally consists of one or more major soils and at least one minor soil and is named for the major soils

soil characteristics:

corrosivity to concrete - the potential of the soil to corrode unprotected concrete. Ratings are:

low - generally includes 1) coarse-textured and moderately coarse-textured soils, organic soils that have pH greater than 6.0, and 2) soils that contain less than 1,000 parts per million of water-soluble sulfate (as $SO_4$)

moderate - generally includes 1) coarse-textured and moderately coarse-textured soils and organic soils that have a pH of 5.5 to 6.5 and medium- and fine-textured soils that have a pH of 5.0 to 6.0, and 2) soils that contain more than 1,000 to 7,000 parts per million of water-soluble sulfate (as $SO_4$)

high - generally includes 1) coarse-textured and moderately coarse-textured soils and organic soils that have a pH of 5.5 or less, and medium- and fine-textured soils that have a pH of 5.0 or less, and 2) soils that contain more than 7,000 parts per million of water-soluble sulfate (as $SO_4$)

corrosivity to steel - refers to soils containing a high percentage of elements that, in the presence of free water, can corrode uncoated steel at a relatively fast rate. Ratings are:

low - generally includes well-drained soils that have a moderately coarse-textured and medium-textured control section and somewhat poorly drained soils that have a coarse-textured control section. The soils are moderately permeable to rapidly permeable. The total acidity ranges from 4.0 to 8.0 meg per 100 g of soil, or electrical resistivity at mositure equivalent is 5,000 to 10,000 ohm-cm at 60°F, or electrical conductivity of the saturation extract is 0.1 to 0.2 mmho per centimeter at 25°C (slightly corrosive)

moderate - generally includes well-drained soils that have a moderately fine-textured control section and moderately well-drained soils that have a medium-textured control section. Also included are somewhat poorly drained soils that have a moderately coarse-textured control section, and very poorly drained soils, including peats and mucks, in which the water table remains at the surface throughout the year. Permeability is moderately slow to slow. The total acidity ranges from 8.0 to 12.0 meg per 100 g of soil, or electrical resistivity at moisture equivalent is 2,000 to 5,000 ohm-cm at 60°F, or electrical conductivity of the saturation extract is 1.2 to 1.4 mmho per centimeter at 25°C (moderately corrosive)

high - generally includes well-drained and moderately well-drained fine-textured soils; moderately well-drained, moderately fine-textured soils; somewhat poorly drained soils that have medium-textured and moderately fine-textured control sections; and poorly drained soils that have coarse-textured to moderately fine-textured control sections. Very poorly drained soils are included where the water table fluctuates within 1 foot of the surface sometime during the year. The total acidity ranges from 12.0 to 16 meq per 100 g of soil, or electrical resistivity at moisture equivalent is 1,000 to 2,000 ohm-cm at 60°F or electrical conductivity of the saturation extract is 0.4 to 1.0 mmho per centimeter at 25°C (severely corrosive)

drainage - refers to the relative rapidity and extent of removal of water from the surface and from within the soil under natural conditions. Saturated soil conditions are related to liquefaction under some circumstances. Poor drainage can also accelerate pipeline corrosion. Terms that are commonly used to describe drainage:

very poorly drained - water is removed so slowly that the soil is moist most of the time; water ponds on the surface frequently, and the water table is at the surface most of the time

poorly drained - water is removed so slowly that the soil is moist a large part of the time; the water table is at or near the surface during a considerable part of the year

somewhat poorly drained - water is removed slowly enough that the soil is wet for significant periods but not all of the time

moderately well drained - water is removed somewhat slowly, and the soil is wet for a small but significant part of the time

well-drained - water is removed readily but not rapidly

somewhat excessively drained - water is removed so rapidly that only a small amount of it is available to plants. Only a few crops can be grown, and yields are usually low unless the soil is irrigated

excessively drained - water is removed very rapidly; enough is lost that the soil is unsuitable for ordinary crops. Saturated soil conditions are related to liquefaction under some circumstances. Poor drainage can also accelerate pipeline corrosion

depth to water table - water table is defined as the upper surface of the ground water. Depth to water table should be known in order to assess liquefaction potential, corrosion hazard, and construction-dewatering conditions along the proposed routes

permeability - refers to the readiness with which air, water, or plant roots penetrate into or pass through its pores. Permeability ratings are very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid. Permeability rate of water through soil is expressed in inches per hour. Ratings of soil permeability are shown below:

| Permeability Rating | Inches per Hour |
|---|---|
| Very slow | 0.06 |
| Slow | 0.06- 0.20 |
| Moderately slow | 0.20- 0.60 |
| Moderate | 0.60- 2.00 |
| Moderately rapid | 2.00- 6.00 |
| Rapid | 6.00-20.00 |
| Very rapid | 20.00 |

shrink-swell potential - greatest in soils having a high content of montmorillonite clays. These have a great tendency to absorb moisture and increase in volume. Ratings of shrink and swell potential are explained below:

low - generally includes soils that are silt loam, silty clay loam, clay loam, silty clay, sandy clay, and clay that contains minerals. These soils have a COLE of 0.01-0.03 and a PVC of 1-2

moderate - generally includes soils that are silty clay, silty clay loam, clay loam, sandy clay loam, and clay containing mixed clay minerals that include some montmorillonite or other high shrink-swell minerals. These soils have a COLE of 0.03-0.06 and a PVC of 2-4 high - generally includes soils that are clay loam, silty clay loam, silty clay, sandy clay, and clay that are made up of a large percentage of montmorillonite or other high shrink-swell clay minerals. These soils have a COLE of 0.06-0.09 and a PVC of 4-6

slope - rise in elevation per 100 feet of horizontal distance expressed in percent. A slope of 10 percent, for example, indicates a rise of 10 feet in 100 feet of horizontal distance. Slopes are further defined in the following table:

| Percent Slope | Descriptive Terms<br>Simple | Complex |
|---|---|---|
| 0-2 | Nearly level or level | Nearly level or level |
| 2-5 | Gently sloping | Undulating |
| 5-9 | Moderately sloping | Gently rolling |
| 9-16 | Strongly sloping | Rolling |
| 16-31 | Moderately steep | Hilly |
| 31-51 | Steep | Steep |
| 51-76 | Very steep | Very steep |
| 76+ | Extremely steep | Extremely steep |

Excavation on steep slopes may be more difficult because of access problems. Soils on steep slopes tend to be thinner and more susceptible to water erosion than soils in less steep areas. Bedrock, cobble, and large stones might underlie soils at shallow depth

soil depth - depth at which bedrock, cobble, large stones, caliche, or hardpans are encountered below the surface

soil profile - a vertical cross section of the soil through all its horizons and extending into the parent material

soil profile mixing - mixing of soil horizons during excavating and backfilling operations, as in construction of pipelines and similar trenching activities

soil texture - relative proportions of the various soil separates in a soil material. The proportions of sand, silt, and clay in different textures of fine soil are divided into textural classifications such as sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silt loam, sandy clay, silty clay, and clay

Soil texture influences susceptibility to both wind and water erosion. It also influences the ease of excavation and the recovery rate (revegetation) of disturbed or denuded areas

surface rockiness - presence of bedrock at the surface

surface stoniness - relative proportion on the surface of stones or rock fragments that are greater than 10 inches in diameter. Stoniness is sometimes, but not necessarily, an indication of shallow depths to bedrock

topsoil suitability for revegetation - a relative rating for establishing and maintaining vegetation. Criteria are essentially the same as for soil productivity in chapter 2, Soils

water erosion potential - the vulnerability of soil to erosion by action of water. Ratings of low, medium, and high are arbitrary ratings used only for purposes of this document. They are based primarily on the soil erodibility factor "k" (universal soil loss equation) as assigned to soil series by the Soil Conservation Service. The "k" values consider soil texture, percent of sand greater than 0.10 mm, soil organic matter content, soil structure, soil permeability, clay mineralogy, and coarse fragments. Things considered other than the "k" factor are rainfall intensity, distribution, amount, and length and steepness of slope. Quantified ratings are as follows:

| Water Erosion Potential | Annual Soil Loss (tons/acre) |
|---|---|
| Low | 5 |
| Medium | 5-45 |
| High | 45 |

wind erosion potential - the susceptibility of a soil to erosion by wind action. Soils that are dry, loose, fine-grained, noncohesive, and unprotected by vegetation or other surface material are most susceptible to erosion by wind. In areas of high vulnerability pipeline could be uncovered. Ratings of low, medium, and high are arbitrary ratings used only for purposes of this report. They are based mainly on soil texture, soil structure, annual precipitation and intensity, and prevailing wind conditions. Quantification of ratings is as follows:

| Wind Erosion Potential | Annual Soil Loss (tons/acres) |
|---|---|
| Low | 5 |
| Medium | 5-45 |
| High | 45 |

specified minimum yield strength - stress value supplied and guaranteed by a steel manufacturer; minimum stress at which a specified deformation of the steel will occur. This value is the basis for all design strength calculations

SPM - single point mooring; a type of mooring constructed offshore in a clear area of sufficient water depth to permit tankers to moor without tug assistance and to weathervane

spring tide - a tide of greater than average range around the times of new and full moon

substratum - the zone of relatively unweathered material beneath the subsoil

surge - a transient internal pressure wave resulting from an abnormal operating condition such as a sudden stop of a pump due to power failure surge tank - see relief tank

TCM - Texas Climatological Model; a diffusion model used to calculate annual concentrations of air pollutants

tectonic - of, pertaining to, or designating the rock structure and external forms resulting from the deformation of the earth's crust; applied to earthquakes, it describes shocks not caused by volcanic action, collapse of caverns, or landslides

TEM - Texas Episodic Model; a diffusion model used to calculate short-term average concentrations of air pollutants

throughput - volume of feedstock (e.g., crude oil) processed or transported in a specified time

TNT - trinitrotoluene; an explosive material. One ton of TNT is defined as yielding one million kilocalories of energy

topsoil - surface soil presumed to be fertile, to respond well to fertilization, and to be rich in organic matter

total suspended particulates - the mass of particles suspended in the air, commonly measured in terms of micrograms per cubic meter of air

trajectory - in air or water pollution analysis, the path a pollutant follows or is assumed to follow

turbine - prime mover (engine) that uses a gas or liquid fuel to produce high-temperature exhaust gases under pressure to drive a high-speed rotating element mechanically connected to the driven machine

turbine meter - a liquid flow rate meter which employs a high speed rotating element driven by the flowing liquid

ug/m$_3$ - millionths of a gram per cubic meter, a unit of concentration in liquids and gases

UHF - Ultrahigh Frequency; range of frequencies from 300 to 3,000 megahertz

understory - shrubs and small trees growing under the cover of trees

urban - area of intensive human use; much of land surface covered by structures

VALLEY - a diffusion model incorporating terrain features used to calculate short-term concentrations of air pollutants

viscosity - resistance of a fluid to flow

VLCC - Very Large Crude Carrier, a tanker of 160,000 deadweight tons or larger

VOR - Very high frequency Omnidirectional Range station; a ground-based electronic air navigation aid which transmits navigation signals 360 degrees in azimuth

VTS (VTCS) - Vessel Traffic (Control) System; a radar and radio communication system used to space large ships in and near harbors

weathervane - when a vessel attached to a mooring buoy swings around to face with its bow into the prevailing wind, wave, or current

WINDOW - a diffusion model used to calculate frequency of occurence of various concentrations of air pollutants

year-class - offspring produced during a given year

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